WIRE AND WIRE PRODUCTS

JUNE 1934

NICKO

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WIRE AND STRIP

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OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

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		888.00
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✦ ✦ ✦

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✦ ✦ ✦

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The Mark of CARBOLOY

Write for free folder D-34 describing factors to analyse in determining most economical Carboloy Die requirements.

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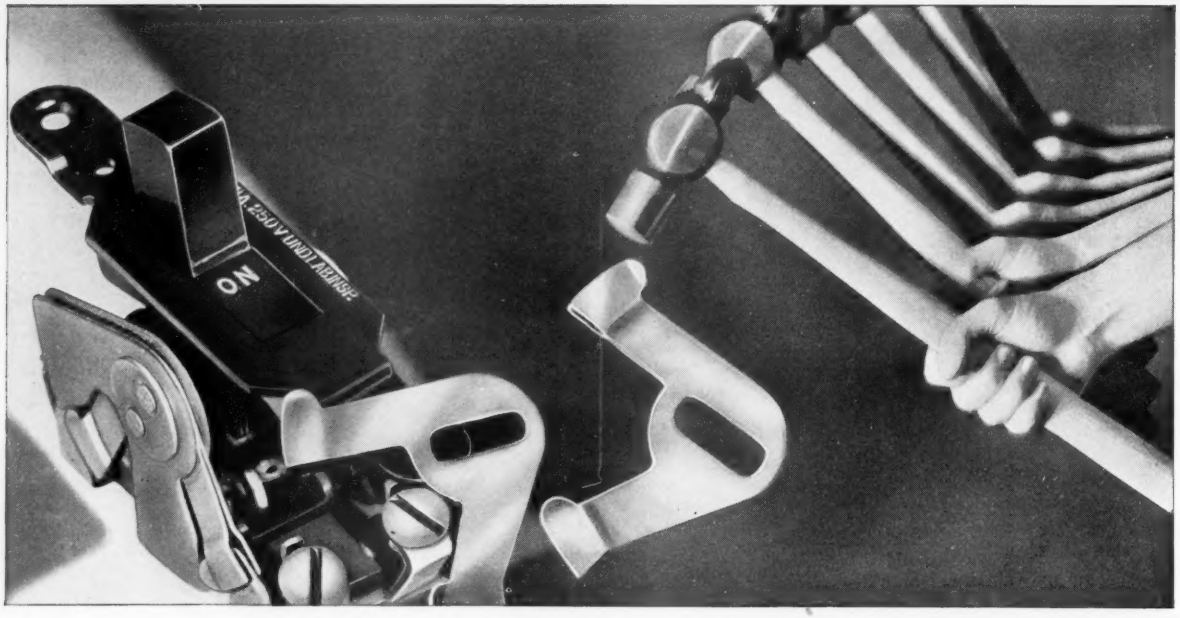

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WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip Wire Products and Insulated Wire and Cable.

DRAWING—ROLLING—EXTRUDING—FORMING—FABRICATING

Vol. 9 June 1934 No. 6

Designated as
Official Publication By The Wire Association

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Executive and Editorial Offices:
17 E. 42nd St., New York City. Telephone: Murray Hill 2-4188

Publication Office: Washington, N. J.
Annual Subscription, U. S. $5.00, Canada $5.60
50 Cents a Copy Issued Monthly Foreign, $7.50

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WIRE & WIRE PRODUCTS, Vol. 9, No. 6, June, 1934. Executive office, 17 East 42nd St., New York, N. Y. Published by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Secretary and Treasurer. Publication office, 49 E. Washington Ave., Washington, N. J. Subscription price: U. S., $5.00; Canada, $5.60 per year, 50 cents per copy; Foreign, $7.50 per year. Entered as second class mail at the Post Office, Washington, N. J., under Act of March, 1879.

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ANNOUNCING—

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ENLARGED FACILITIES—
A NEW AGENCY—
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FIRTHITE AND FIRTHALOY
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—o—

The Firth-Sterling Steel Company, a pioneer manufacturer of Sintered Carbide and Tungsten Carbide Drawing Dies, has opened a **Branch Sintering Plant at**

2800 East Grand Boulevard, Detroit, Michigan.

—o—

In addition to the installation of the branch plant, the **Firthaloy Die Department** under the management of Mr. A. R. Zapp has been enlarged with new equipment and personnel. Mr. H. W. Elias, Assistant Manager, will have charge of customers Engineering Service and new applications.

—o—

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WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
Wire Products and Insulated Wire and Cable.
DRAWING --- ROLLING --- EXTRUDING --- FORMING --- FABRICATING

Vol. 9 June 1934 No. 6

Aluminum Electric Transmission Cable

By F. Reade Dallye,

Assistant Engineer, Cable Division, Aluminum Company of America, Pittsburgh, Pa.

The development of aluminum stranded power transmission cable and a description of the processes entering into its manufacture. ▲▲▲▲▲▲▲

A stockyard fume was responsible for the installation of the first half mile of the 400,000 miles of aluminum conductor cable now in use in this country. Most recent large order for this type of cable came from the Tennessee Valley Authority, which purchased 678 miles of it.

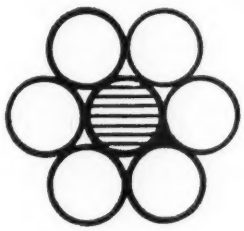
✦ ✦ ✦

COPPER, the traditional standard electrical conductor material, was attacked by certain fumes in the Chicago stockyards in April, 1897. Stockyard authorities decided to try out half a mile of aluminum wire for a telephone line. Since then the use of this material has reached imposing proportions.

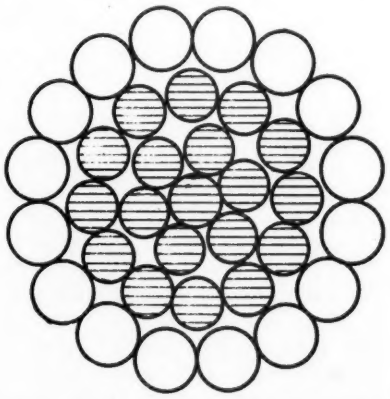
✦ ✦ ✦

Electrical Uses of Aluminum

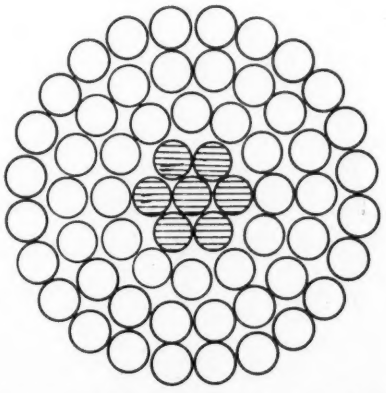
THE consumption of aluminum in the electrical industry has grown side by side with the growth of electric power consumption. The largest demand for aluminum electrical conductor during the past ten years has been in the form of stranded wire for overhead trans-



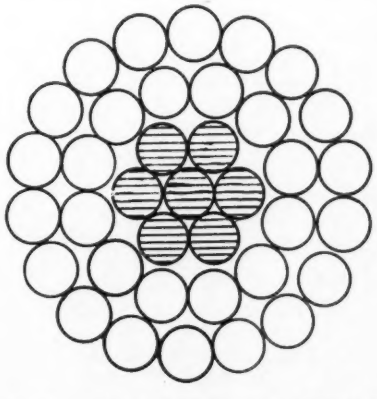
(B) 6 strands of aluminum over 1 strand of steel.



(A) 16 strands of aluminum over 19 strands of steel.



(C) 54 strands of aluminum over 7 strands of steel.



(D) 30 strands of aluminum over 7 strands of steel.

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mission lines, ranging from 4,000 to 220,000 volts. It has also found a market in the form of bars, tubes and structural shapes for use as busbar in power stations and industrial plants.

✦ ✦ ✦

First Installation of Stranded Aluminum Wire For Power Transmission

THE first installation of any importance of stranded aluminum wire for power transmission was made about 1900. These cables, of pure aluminum, were gradually superseded by a new type of aluminum conductor for long span transmission lines.

✦ ✦ ✦

THIS cable was of the ordinary concentric strand type, but the central wire, or wires, were of extra high-strength galvanized steel. The new product was called "Aluminum Cable, Steel Reinforced," and its nomenclature was soon abbreviated to "A. C. S. R." The use of all-aluminum cables fell off rapidly in favor of the stronger A. C. S. R.

✦ ✦ ✦

The Problems Affecting Design of A. C. S. R.

A GOOD material, like a good man, may be expected to have both virtues and vices. The greatest virtue of A. C. S. R. is the fact that it has the highest ratio of strength to weight of any available transmission line cable. But to offset the virtues of high strength and light weight, A. C. S. R. is afflicted with the largest diameter of any of the better known standard conductors.

✦ ✦ ✦

IN designing transmission line spans, engineers must take into account expected loadings of ice and wind. The ice loading is assumed to form a uniform coating of ice around the conductor. Since the diameter of an aluminum cable is greater than that of other cables, the ice loading is also greater.

✦ ✦ ✦

BUT just as a man's vices may sometimes operate to his advantage, so this inherently larger diameter, undesirable mechanically, is sometimes in demand for electrical reasons. One of the problems in high voltage transmission line design is that of corona loss, which is a discharge affected by a number of conditions, such as line voltage, size of conductor, barometric pressure and humidity.

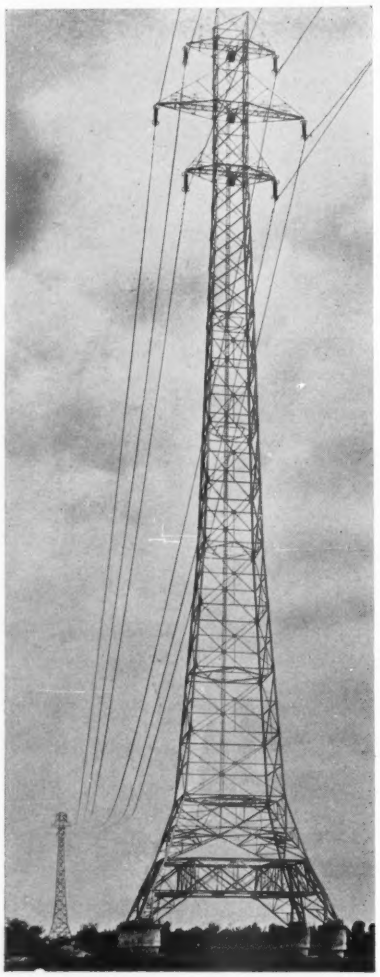
✦ ✦ ✦

CORONA loss took its name from the bluish halo, of "corona," visible at night on the cable under severe conditions.

✦ ✦ ✦

The Tennesee Valley Authority Cable

THE cable purchased by the Tennessee Valley Authority will run from Norris Dam at Cove Creek, Tennessee, to Wilson Dam, Muscle Shoals, Alabama. It will be used at first for supplying power to the construction equipment at Norris Dam and finally for transmitting power from this development to the many consuming communities.



Mississippi River Crossing of Arkansas Power and Light Company and Memphis Power and Light Company.

High over the Mississippi swing these double circuit 307,500 c. m. conductors made of A.C.S.R. The towers, supported on concrete caissons, rise 435 ft. into the sky. The caissons are 128 ft. deep, 28 ft. lower than the river bottom in order to provide secure foundations. The tower in the foreground is 10 miles below Memphis, Tennessee, and 4,300 ft. beyond is a corresponding tower on the Arkansas side of "Ol' Man River". ✦

✦ ✦ ✦

WHERE this line traverses relatively flat country the spans will be uniform in length and the cable will have a diameter of ,931 in. It is composed of 37 strands, each .133 in. in diameter. These are concentrically stranded and the central wire is of galvanized steel. The ultimate strength is 14,200 lb., and the weight of the cable is 644 lb. for every 1,000 ft.

✦ ✦ ✦

FOR the mountainous part of the line where long spans are required, a different stranding is preferable. In this application 26 strands of aluminum are used over seven strands of steel. The diameter of the aluminum strands is .1564 in., while that of the steel is .1216 in. The total diameter of the cable is .990 in., and the ultimate strength is 25,000 lb., with a weight of 875 lb. per 1,000 ft.

✦ ✦ ✦

IN addition to the large cables, a considerable quantity of smaller sizes of A. C. S. R. is being used by the Tennessee Valley Authority for rural distribution. These conductors are seven-strand, six aluminum over one steel, and their sizes are No. 4, No. 2 and No. 1/0.

✦ ✦ ✦

Fabrication of Conductor Wire

THE manufacture of aluminum cables involves three major operations: **rolling, wire drawing and stranding.**

✦ ✦ ✦

Rolling Operations

1. ROLLING operations start with a cast ingot, the dimensions of which are 6 in. by 6 in. by 36 in., with a weight of approximately 120 lb. A combination of hot and cold rolling forms the ingot into a coiled rod by first heating the ingot to about 900 deg. F. in an oil-fired continuous-pusher-type furnace. Control of temperature for electrical conductor rod

rolling need only be exercised within reasonable limits, and this pure aluminum is rolled successfully by applying approximately the same drafts used in the rolling of ordinary open-hearth steel.

✦ ✦ ✦

The Rolling Equipment

THE rolling equipment includes a breakdown mill and a six-stand Belgium-type finishing mill. Either 16 in. or 18 in. diameter rolls are used in the breakdown mills. Each finishing mill consists of five three-high stands and one two-high stand, having roll diameters from 10½ in. to 11½ in. The delivery speed of the finishing mills is 1,575 ft. per minute.

✦ ✦ ✦

Cold Rolling Controlled by Physical Properties of the Finished Wire

THE physical properties desired in the finished wire control the amount of cold rolling and the intermediate annealing point. The strength of the wire is proportional to the amount of cold work — either cold rolling or cold drawing.

✦ ✦ ✦

The Drawing Operations

2. ALL **drawing** operations are started from coiled rod, the temper of which may be varied from fully annealed to semi-hard, depending upon the diameter of the wire. The type of wire drawing machine used has eight or ten die positions and is of the multiple tandem type.

✦ ✦ ✦

A TEN-DIE machine will draw .083 in. wire directly from rod at one pass through the machine; larger diameters may be drawn by reducing the number of dies. Tungsten carbide dies are used throughout on these machines; both the eight-die and the ten-die tandem machines are powered with 75 hp. motors, and their delivery speed is from 2,000 to 2,500 ft. per minute.

✦ ✦ ✦

THE wire delivers from the machines directly onto stranding machine bobbins, each having a capacity of 120 lb. of wire. The lubricant used in wire drawing is a tallow base aqueous solution, employing sufficient caustic to saponify the tallow.

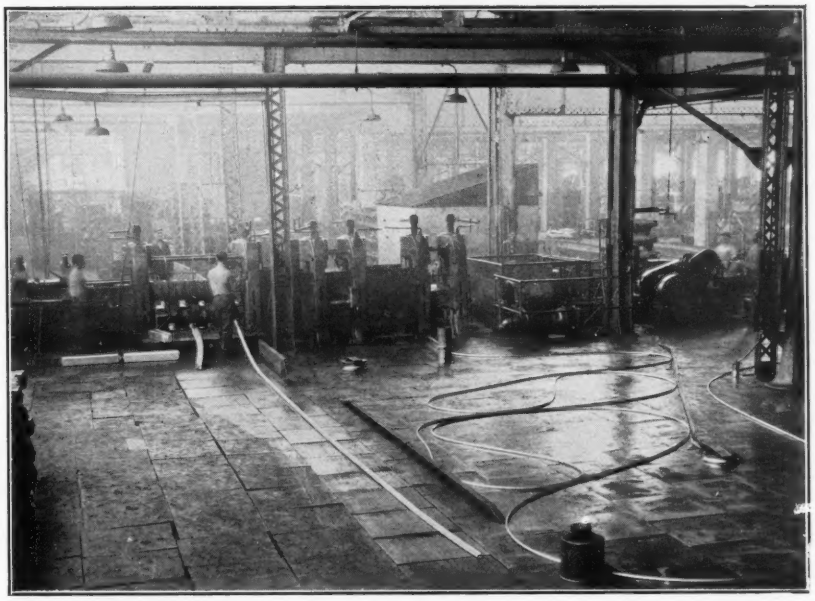


Fig. 1. The 16-in. breakdown rod mill. Cast ingots, 6 in. by 6 in. by 36 in. are lying in the left foreground. These are fed into the mill, and by a combination of hot and cold rolling they are formed into coiled rod, such as shown on the right. Rod in two different stages of production was being passed through the mill as the picture was taken. ✦ ✦ ✦ ✦ ✦ ✦ ✦

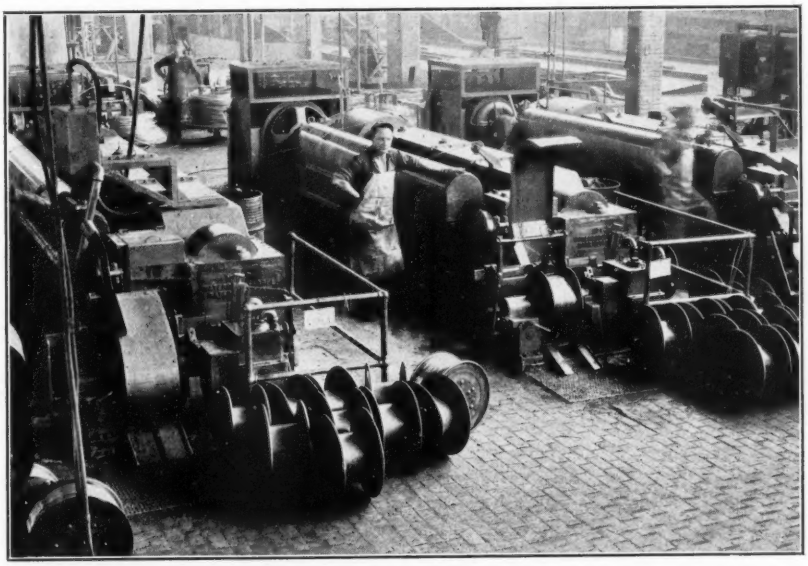


Fig. 2. Battery of tandem wire drawing machines. The aluminum rod consists of a coil laid on a rotating platform, such as shown in the left center background. The rod from this particular coil is run through the center wire drawing machine, whose dies are arranged in tandem form, whence the machine gets its name. After passing through the machine the rod, now wire, is taken up on the reel in the right foreground. The guard is raised to show wire reeling. ✦ ✦ ✦ ✦

✦ ✦ ✦

SLEEVE-TYPE drawing machines, having a main shaft and a cone-shaped idler shaft, draw the larger diameter wires. From three to six dies are employed, and the machines operate at speeds from 450 to 650 ft. per minute, with one operator serving several machines. The wire, spooled on stranding machine bobbins in the drawing machines, is then delivered to the stranding machines.

(*Please turn to page 189*)

Simplicity in Acid Cleaning Plant

By Richard Saxton

Works Manager, Sheffield, England

British design for muriatic acid cleaning department reducing material handling to the least possible number of operations. With slight modifications this plant is adaptable for cleaning with sulphuric acid.

IN planning the Acid Cleaning Department here described, the fundamental object was to reduce "manhandling" to the least possible number of operations. These, after a careful survey of the whole process, were finally reduced to two; the placing of material in position ready for hoisting for immersion, and the unloading from the bogie in the mill ready for drawing operation.

✦ ✦ ✦

AS space for installation was restricted, being approximately 86′ 0″ by 22′ 0″, each operation had to be carefully studied and just as much space allocated as would allow for efficient production. Cost being a matter of primary importance, elaborate or costly machinery was ruled out, and whilst simple in construction the plant was so designed that, once hoisted from the floor, material did not again come in contact until unloaded in the drawing mill.

✦ ✦ ✦

WHILST applicable to the cleaning of any quality of wire material this plant was laid down for the cleaning, with muriatic acid, of high carbon, shaped, locking wires for the construction of locked coil winding ropes; and for cylindrical material as required. The lay-out as shown, gave an output of 15 tons of shaped material per 8 hour day with the services of two operators only. It should be noted that the process was the cold method, with the acid at atmospheric temperature throughout the whole operation.

✦ ✦ ✦

WITH cylindrical un-patented material the output was considerably increased as, due to the more compact winding of the coils, greater weight could be loaded on a bar. The works being situated in the centre of a town, spent acid had to be run into the town sewers, and it was anticipated that objection would be taken to this practice. Lay-out of cisterns and drain was therefore so designed that, in case of complaint, evidence could be readily furnished that damage by acid when released was practically nil.

✦ ✦ ✦

THE various designs, whilst not to scale, have been simplified in order that if desired any part or equipment can be readily adapted to the present plant.

✦ ✦ ✦

General Layout of Department

See Figure 1

THE four acid tanks were constructed of stone slabs, interior measurements being 8′ 0″ by 4′ 0″ by 4′ 6″ deep. Joints were rubber lined, and the whole held in place by galvanized-iron tie bolts. It was decided that the steeping tank should be of stone in place of wood, thus furnishing, in case of emergency, an additional cleaning tank.

✦ ✦ ✦

THE washing space needs no description, being merely an open space of adequate dimension

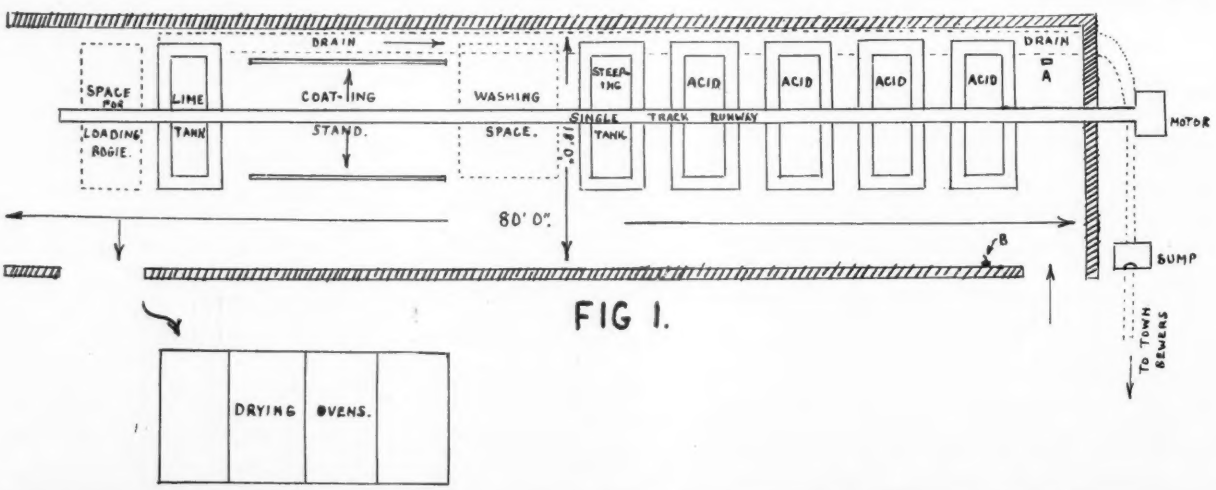


FIG 1.

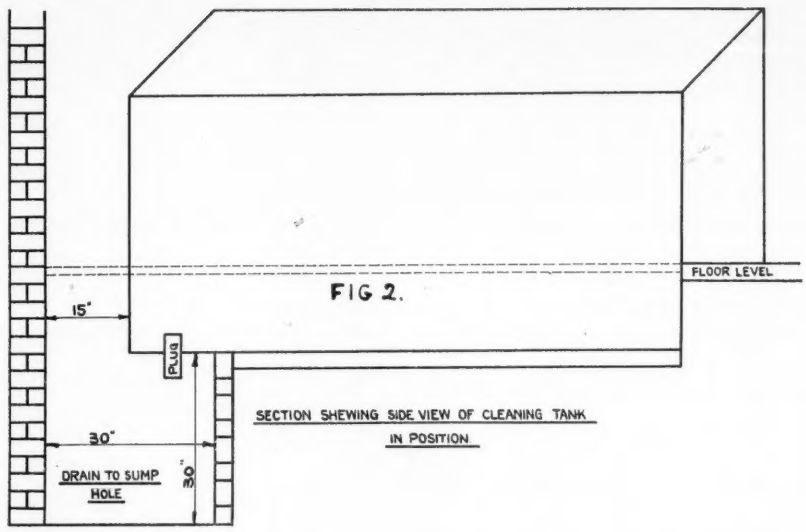


FIG 2.

to allow of efficient washing of material after leaving steeping tank. The floors of this and the coating stand were constructed of acid-proof cement, laid with a slight incline to carry off water to drain.

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THE coating stand, constructed of two length of 3″ by ⅜″ T iron mounted on 4 wood pillars, was designed to hold 4 loads of material during the coating period. The method of placing or fixing material on stand will be described later.

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AT the back and next to coating stand was placed the lime tank, (wood), and whilst in this particular process the lime was used in a cold state, the tank was designed to be available for hot-liming if, and when, desired. Halfway down the short side nearest to the drain a one-inch hole was bored and a plug inserted. The withdrawing of this each morning after the lime had settled overnight, enabled the water to be run off without loss of lime; this latter, when settled, being below the line of the plug. The addition of fresh water each day not only kept lime contents in clean condition, but rendered the neutralising action more efficient.

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Acid Cisterns and Tanks--See Fig. 2

ACID cisterns and steeping tanks were laid in position as in **Fig. 2.** The position of the plug as illustrated enables it to be driven easily and quickly when it is desired to run off acid, whilst in case of leakage steps can be taken to overcome this condition quickly. Time saved by this method as compared with that of groping in the acid for plug was found to be considerable. Drains were covered at the floor level by cross-lengths of 6″ by 2″ floor boards, which were only removed when required to tap a plug or inspect the drain.

✦ ✦ ✦

Method of Raising and Lowering Materials--See Fig. 3

BOTH the lower bar on which the material is threaded, and the upper, are constructed of 3″ by 3/8″ T iron. This shape was selected as giving the requisite strength without undue weight.

The smaller bar was made to a length to give two inches clearance at each end when inserted in the cistern, whilst the top was cut sufficiently long to rest safely on edges of tank.

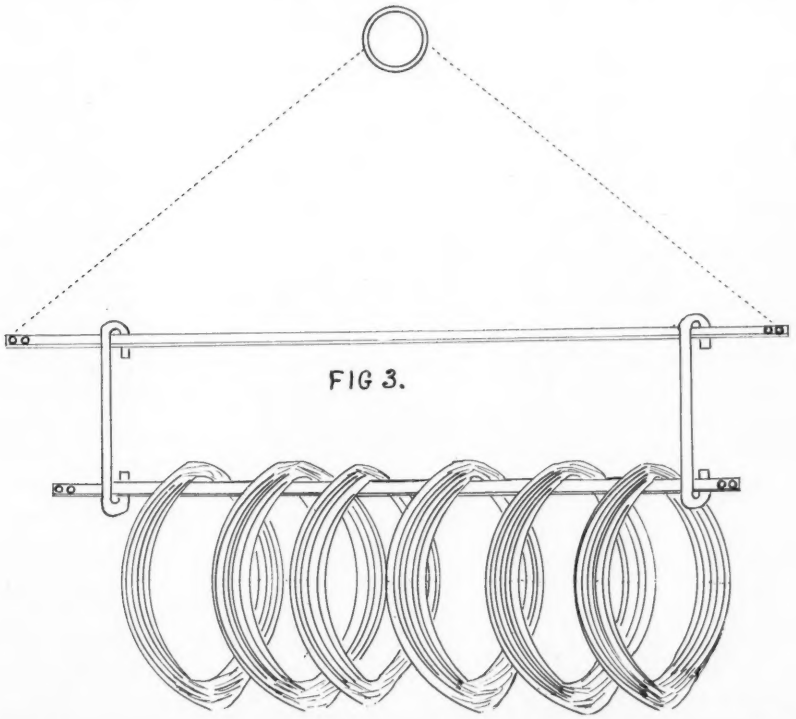
FIG 3.

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THE two hooks supporting the bottom bar and load were constructed of 1½ inch, round iron. Strict instructions were issued that when replacing, new hooks were to be of iron and not steel, as latter, under repeated immersion in HCl became acid short, when it was liable to fracture without warning. It was found that the iron gradually corroded until, when weight became too heavy,

the hook part commenced to slowly open, thus giving warning that it was time to replace.

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REPLACEMENT of the lower bar due to constant immersion in acid was anticipated to prove a costly proposition, but the average working life with heavy loads was found to be 12 months. When discarded for heavy loads these bars gave a further 18 months service in the cleaning of wire.

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THE practice of suspending the material from the top of the tank not only speeded up the immersion time, but allowing scale to fall clear of coils, permitted a more even attack by the acid. Immersed or raised smoothly it was found that little scale was placed in circulation when the load was moved.

✦ ✦ ✦

DUE to this and the fact that it was possible to have a layer of scale 12 inches deep on the bottom of the tank before this came into contact with bottom of coils, it was decided to give the method of adding fresh acid daily, a trial.

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THE adoption of this scheme in replacement of the former method of working the bath till spent, effected a saving in acid consumption of 15%, and it was rarely found necessary to run off and make up a new bath under a period of eight full working weeks. Where scale showed tendency to accumulate under load before the bath was spent, it was removed by a shovel specially made for the purpose.

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How Handling Operations Were Reduced

AS previously stated this plant was designed to reduce handling operations to the least possible number, and the following account describes how these were reduced to the placing of material into position for cleaning, followed by unloading in the drawing mill.

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THE charge intended for cleaning was first reared up against A, a wood post erected for this purpose, and the smaller bar passed through coils to right of post. The larger bar was placed on top of the coils and the two connected together by means of the hooks. Hooks attached to sling chains were then inserted in holes drilled in the top bar for this purpose, and the load gently hoisted a few inches by means of the crane.

Note—Second operator after assisting to place material in position for hoisting works lever of crane at B, taking no further part in dealing with the load until required to assist in placing bogie in the drying oven.

✦ ✦ ✦

THE object in raising a few inches only was to enable the load to be balanced on the bottom bar, this being essential for efficient travel, any tendency to dip causing the load to slide with a possible risk of accident.

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HAVING been balanced correctly the material was raised to clear the cistern, brought into position for immersion, then gently lowered until top bar was resting on the cistern top; smaller bar being guided into tank by one operator whilst the second worked the lever controlling raising, lowering and travelling operations.

THE plant employed for raising, lowering and travel was an electrically operated travelling carriage, working on a single track placed over the centre of tanks. Motor, as will be observed, was erected outside the department in order to protect from acid fumes. Apart from weekly cleaning and lubricating, the motor required little attention, whilst effect of acid fumes was found to be practically nil.

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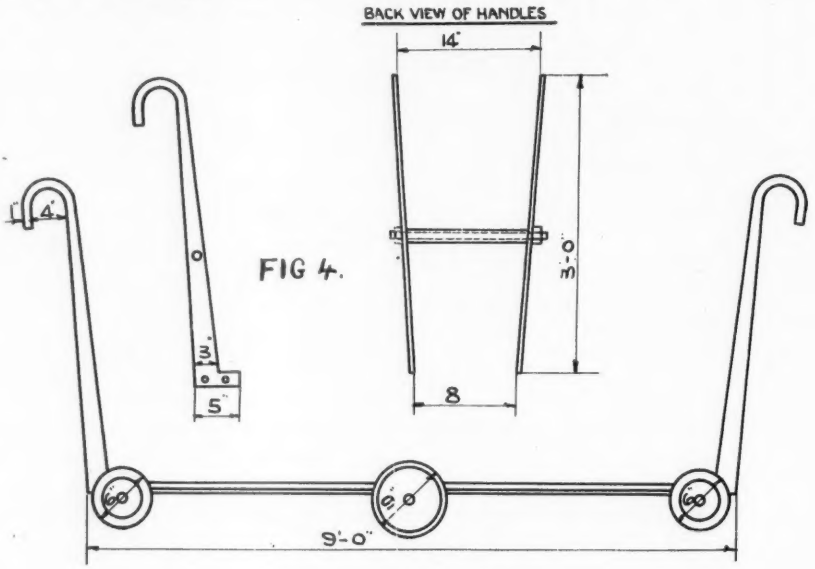

FIG 4.

BOGIE FOR WIRE AND RODS

THE motor was geared to take double the average weight, in order to counter any damage that might arise from unexpected strain. Wire rope for hoisting purposes was heavily lubricated with vaseline before being placed in position, and the operation of greasing carried out monthly. The approximate life of rope was 12 months, and it was noted that at the end of this period stray wires commenced to fracture at different parts of the wind. Broken wires were rarely found before 11 to 12 months service had elapsed.

✦ ✦ ✦

AT end of the immersion period the material was raised, carried over to the steeping tank, and allowed to remain for about two minutes in order to allow water to

(*Please turn to page 191*)

The Spooling Question

By Kenneth B. Lewis,

Consulting Wire Mills Engineer, Worcester, Mass.

A contrasting study of the methods used in spooling operations in steel and copper wire mills. Some suggestions for improvements in steel mills spooling practices.

WHEREVER steel and copper wire men are gathered to compare and contrast their problems two related subjects are sure to come up, namely the great difference in drawing speeds and in the use of spools. These discussions are seldom satisfying, for the two groups find it hard to catch one another's view points. The copper men generally feel that the steel men have evaded the issue. The steel men, starting out with the intention of explaining the difficulties of their position, wind up by making positive statements which are not accepted, and retire with a feeling of exasperation. They know they are right, but it disconcerts them to be asked to defend and explain practises so deeply rooted as to be really basic and fundamental. They feel they have been asked to prove 2 + 2= 4.

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I KNOW the feeling well, for not only have I taken part in these skirmishes, but I have had unusual opportunities to get the viewpoint of keen-minded outsiders looking in on the wire industry. Their views are interesting, and their questions, though embarrassing, are very stimulating to the faculties. They are never satisfied by the statement that a certain practice is necessary and other practices "impossible". They must know why. And one who conscientiously tries to interpret wire drawing to these outsiders sooner or later find himself wondering which details of practice are really tied firmly to the available tools and the basic properties of the metal and which are rooted only in tradition and are possibly the outgrowth of conditions which have already passed away.

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THE most severe test of theories, explanations, and assertions, consists in setting them down on paper. Contradictions and inconsistencies which slip past in a spirited discussion have a way of sticking up and catching the opponent's eye when they are on record. If the editor of WIRE AND WIRE PRODUCTS is agreeable I am going to outline this case, get some of the spade-work done, make the necessary concessions, and perhaps get it in shape for the jury.

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LET it be assumed that we are considering low carbon steel and carbide or diamond dies, that the properties of the steel are not materially affected by speed, and that because of artificial cooling of dies and wire the question of heating does not arise. We will consider that single hole work is out of the discussion. Speed is limited at two points, the pay-off reel and the finishing block.

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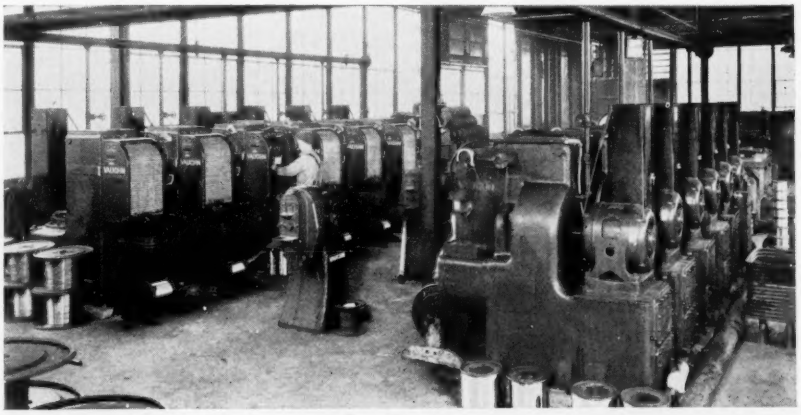
CONSIDERING first such work as is done from the rolled rod we find that an enormous percentage of steel wire is finished in from one to five drafts. In continuous work from steel rod three to five drafts covers the bulk of the tonnage. In copper a heavy tonnage is finished in from 8 to 20 drafts, the first stage being say about 8 drafts. Here at once is a break for copper. Assuming a safe speed off the reel to be 300 f. p. m. average finishing speeds will be, steel, 1,000, copper 2,000. The disparity will actually be greater, for steel is worked from a #5 rod, and copper from a 5/16"



No. 2. Intermediate Vaughn Copper Wire Drawing Machines to draw from No. 10 down to No. 30. Finished wire finished on 130 Lb. spools. ✦ ✦ ✦ ✦ ✦ ✦ ✦ Packard Electric Co., Warren, O.

rod, and the coarser rod will be much less apt to tangle. Even if the finished wire were spooled, the reel problem would limit the speed on steel.

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MOVING along now to intermediate sizes we find the same limitation. In steel the typical run is 4-5 or 6 drafts, in copper, 10 to 12 drafts. Copper also gets another break. The intermediate copper machine is nearly always fed by hard drawn wire, the steel machine by wire which has been annealed, cleaned, lime coated and baked. The hard drawn wire, whether fed from a spool, a running reel, or a stationary cone, goes to the die smoothly at any speed. The annealed wire has slumped down in the pot, is generally nicked slightly by the band wires, has been "opened up" for cleaning, coating and baking, and in general has had a rough handling. It runs rather poorly off a reel, and its strong tendency to tangle is multiplied rapidly as the reel speed rises. Here is a distinction to be noted between the two metals. Copper wire can be hard drawn almost indefinitely. Steel has to be annealed in process, not only because its properties change so as to make it an undesirable product for the market, but because it loses its coating and cannot be drawn further.

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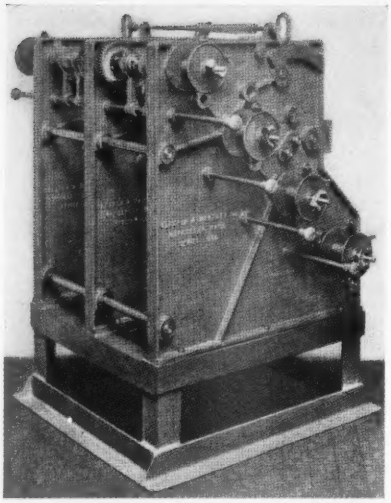
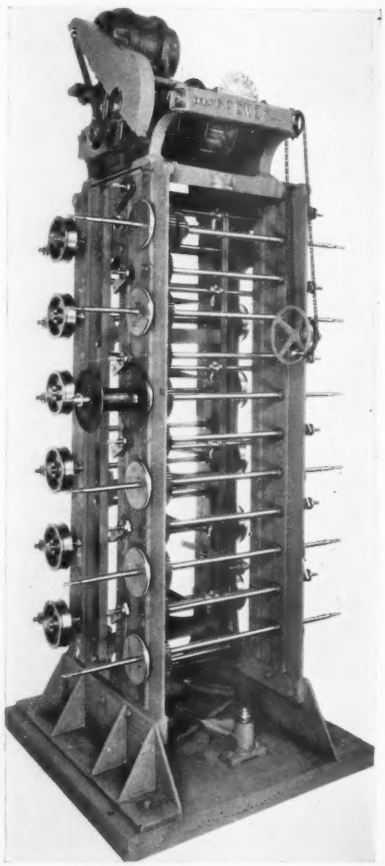
THIS point deserves more elaboration. Between wire and die there is a pressure equal to the yield point of the wire, say between 20,000 and 100,000 lbs. per square inch. At this pressure metals will readily weld to each other, even though cold, if they are clean and of similar nature. Copper is so dissimilar in nature from the die metal that the imperceptible film, if it exists, drawn out of the lubricating bath, suffices to prevent seizing. Steel unfortunately will weld readily to die metal with disastrous results. Contact is prevented by interposing a cushion between the two, either metallic, as in wet drawing, or non-metallic as in dry drawing. The dry cushion is very thin, in fact any attempt to build up a thick film defeats itself for the whole cushion falls off. It becomes thinner at each draft, not only by reason of some loss by abrasion but because at each draft it is called upon to cover more surface. Five or six drafts is about its safe life, and eight drafts about the limit that special skill can attain. The same number of drafts brings the physical properties of the steel into the danger zone. By and large, coating loss is probably the controlling factor, but if coating technique could be much improved we would run into the other factor pretty quickly. This limitation in steel wire practice keeps machines down to 5 or 6 drafts and gives a relatively high reel speed.



Eight spindle spooling machine to take care of any spool up to 7 inch diameter and 5 inch width. It will spool wire from .015" to .041" diameter. All eight spindles can be operated at once, any one or more spindles may be shut down at will, or only half the machine may be run if so desired. Made by Sleeper & Hartley, Inc.

✦ ✦ ✦



Twelve Spindle Vertical Spooler used mostly in connection with Tinning, Saturating and similar functions. This Spooler is provided with capstans to insure uniform rate of wire speed and this rate may be varied by means of the Reeves Variable countershaft placed at the top of the machine. Made by the American Insulating Machinery Co.

✦ ✦ ✦

AT this point in the discussion the copper man brings up the subject of spooling, not only for finished wire but for process wire, and points out that by spooling he beats the limiting factors at both ends of his machine. This is perfectly correct. You can't run wire onto a block at much over 1000 f. p. m., in fact at 800 the mass accumulating on the extension pins or stripper is tossed around a good deal, responding to centrifugal force, and pins and strippers are in danger of sailing across the room. Spools on the other hand run along smoothly at 5000. Here I believe another generalization can be made regarding the steel and copper mills. A heavy proportion of copper wire is worked up in the plant, covered, insulated, enameled etc. In the steel mills a large and increasing percentage is shipped as hard bright wire. Another point must be considered. Steel is a cheap metal, ranging from 1/4 to 1/10 the value of copper depending on the copper market. Characteristically the steel

man talks of tons, the copper man of pounds. Inventory and freight on spools would bear much more heavily on steel wire costs.

✦ ✦ ✦

LET us pause here and give the copper men due credit for what they have accomplished in spooling. Their mill technique, their standardization, and their lining up of the market are real achievements. The steel mills are following along slowly, as the limitations of their metal permit, in the fine end of the business. How far they can go is an open question. Of the steel wire fabricated in the wire mills, nails and fence are the big tonnage. Spooled wire would feed nail or galvanizing units nicely, but practically all such wire is of a size which comes down from the rolled rod in one operation. Speed would still be limited at the reel, and the gain is hard to see.

✦ ✦ ✦

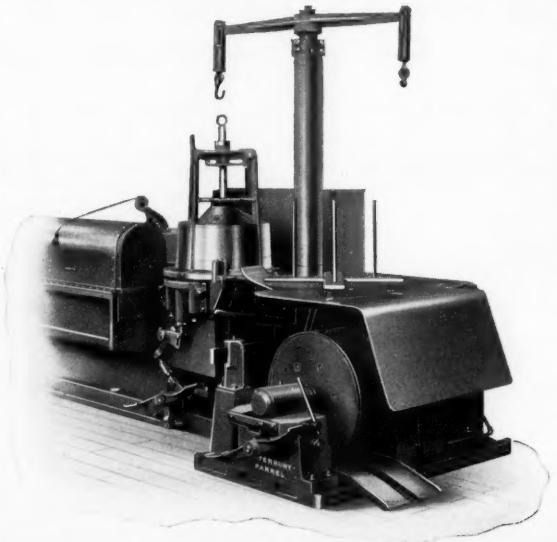
AN enormous advantage of copper wire is that it can be spooled either for shipment, fabrication, or annealing. The whole mill can be run on a spooling basis. The greatest advantage of spooling to steel wire would be to get wire into shape for fast feeding to intermediate and find drawing machines. This means annealing on spools. The copper men point out how successfully they do it, either for shipment, fabrication, or further drawing. The difficulties of a process anneal of steel wire on spools are enormous. I am going to make two statements in behalf of the steel men, and do my best to prove them. The first is that dry drawn wire cannot be annealed without oxidation, and the second is that even if it could it would have to be pickled before further drawing could be done.

✦ ✦ ✦

LET us omit the A. B. C. of closed pot annealing, and go at once into the the controlled atmospheres. Copper is bright annealed in steam or in carbon dioxide. These media are inert toward copper at the usual temperatures. In the presence of red hot iron they are both decomposed, giving up their oxygen to the iron and remaining as hydrogen and carbon monoxide respectively. Oxidation from this source may be slight, especially in the case of carbon dioxide, but wire to be drawn must be not merely clean looking but "chemically clean".

✦ ✦ ✦

ASSUME now that some inexpensive gas could be used which is actually inert to iron. There is oxygen on the surface of the wire in the form of the drawing film. This film is made up of ferric hydroxide, calcium hydroxide, and soap. Overlooking the soap, the other two substances carry water, not entrapped water or water of crystallization which could be driven off at low temperatures, but water chemically combined. $Ca\ O_2\ H_2$ exposed to high temperatures splits to $CaO + H_2O$. This water turns instantly to steam and the steam is decomposed by the red hot wire. You can't beat the game. You can put into the pot extra bright wire, drawn to a point where the cushion is practically gone, and take out wire so near clean that it could be drawn carefully without a pickle, but we are talking not of stunts but of day-by-day practice. Dependable wire-drawing calls for substantial films, and such films carry plenty of combined water.



Type of Spooler used on heavy continuous wire drawing machines. This particular construction is for a Tandem machine fitted with block and also with a floor type spooler. The wire after it emerges from the machine is passed several times around the block and runs to the spooler.

The block is also fitted with a collapsible stripper with an air hoist to remove coils of metal

This allows the operator to finish the wire either in coil form or on spools. Waterbury-Farrel Foundry & Machine Co. ✦ ✦

✦ ✦ ✦

LET us make the further assumption that the steam could be swept out from between the tight coils of wire in a bundle or on a spool before the damage was done. Something would be left behind on the wire. We are not dealing now with a thin organic film such as is found on copper wire, but with a substantial film of inorganic matter, oxides of lime, iron, and soda. They remain on the wire as smut, too tight to shake off, too loose to stand die pressure. This stuff is no longer a lubricant. It has lost its bond to the steel, and no other bond can be made, no new film established, until this stuff has been rubbed, washed, or pickled off. There is in fact considerable doubt whether a dry coat can be bonded to wire safely unless the surface has been etched.

✦ ✦ ✦

STEEL wire on spools would fill a pot nicely, leaving much less than the normal amount of air. The copper people must remember that steel temperatures for process annealing are rarely under 1200 F. and that warping of flanges would be a live problem, but assuming that this trouble could be handled, the spooled and annealed product would have to be pickled, rinsed, limed, and baked before it could be re-drawn. These processes take about 3 hours and involve the handling of wire in loose bundles. It is conceivable that they could be done continuously between the spool and the first die, but at an awful sacrifice of floor space. It is pertinent to point out that the only thing saved by high drawing speed is floor space

and investment, and it looks as though any such rigging as would be involved would more than cancel out possible savings.

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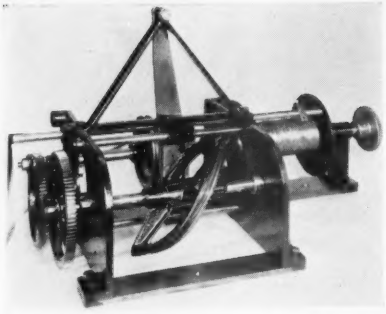
THE spooling and annealing technique would undoubtedly work out smoother in a wet-drawing practice, but it can be safely predicted that the steel mills will not move far in that direction. In fact the trend is in the opposite direction. Steel wires smaller than 20 gauge are commonly drawn wet because of the difficulty of lime coating and baking these small gauges without causing rust. In order to speed up the fine wire machines it would be necessary to spool from the intermediates, and so on back to the rod. Wet drawing is not a serious matter in copper, for the liquid is only in the machine bed. Steel, however, has to be coated in a tub of acidified copper sulphate, and almost certainly needs a slight etch in acid before this coating. It must be kept under liquid all the time to avoid rusting. The process involves repeated dipping and transporting of dripping wire. Solutions have to be renewed, fortified, changed, and the whole neighborhood is wet. Rubber boots, rubber aprons, wooden tubs, slippery



Machine for Spooling braid covered wire on small metal spools. So equipped that different diameters of wires can be laid on the various spools. Fidelity Machine Co.

✦ ✦ ✦

floors, open drains, altogether an unpleasant picture. Wet drawing as compared to dry means lighter drafts, much shorter die life, and more power. To entice the steel mills back to wet drawing the bait would have to be decidedly more tempting than anything yet shown. Still, the possibilities are there. Wet drawn wire on spools could be annealed very bright, probably bright enough to take another copper coat without a pickle. The set-up for a continuous coating and rinsing between spool and die would be infinitely easier to work out than in dry drawing. It has its own problems, but a recent patent discloses a method of cleaning wire in an inhibited acid in such a way that in its subsequent passage through copper sulphate it will take on a predetermined amount of copper and no more.

✦ ✦ ✦

TO sum up, I should say that the steel men must admit that the copper men have put over their spool technique very nicely, lined up their mill practice, and their customers, and worked out the matter of standards in spools with great resolution and cleverness. What they have done is well worth study and its lessons should be carefully noted. The copper men are entitled to do a little crowing, but they should concede that the steel men have a much more complex job. Instead of merely drawing their metal they have to put an overcoat on it, draw the overcoat, and trust that the metal will come along. Their coating wears out and must be replaced, and each replacement involves annealing and pickling. Their annealing temperature is beyond the safe limit of pressed-metal spools. Spooling is creeping into the steel mills, in special applications, and annealing on spools is now being practiced. It will probably go further, but we should not anticipate in the near future any such complete revolution as the copper industry has been able to work out.

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The Wire Association 1934 Meeting and Exhibition

✦ ✦ ✦

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Operating Costs of Small Plants as Affected by the Thirty-Hour Week

By G. D. Hartley
General Manager, Sleeper & Hartley, Inc.
Worcester, Mass.

An analysis outlining the increased overhead charges in small plants which would inevitably result from a thirty-hour week

I WISH to focus attention sharply upon some decisive facts relating to the additional overhead charges in industry which would inevitably result from a thirty (30) hour week. These facts do not appear to be generally known, or to have been brought up or discussed in any specific manner.

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THE great majority of manufacturing plants in the United States of America employ less than fifty employees. These factories or plants are in the main, what might be called "single shift" factories.

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FOR many reasons, unnecessary to enumerate here, it is not found to be practical, or economical or possible to operate the majority of these plants with more than one daily shift of employees. They are, in most cases, "single shift" plants, and any reduction in the number of hours worked per employee per day or week or month in such plants means that a greater burden of fixed charges has to be carried or earned per hour by each such employee.

✦ ✦ ✦

ONLY one single shift can usually be employed, and the whole burden of fixed charges is borne

TABLE 1

TABLE SHOWING AUTOMATIC INCREASE IN OVERHEAD (AND COSTS) DUE TO REDUCTIONS IN WORKING HOURS PER WEEK, IN THE SMALL SINGLE-SHIFT PLANTS AND FACTORIES

AN AVERAGE OVERHEAD OF 175% (ON DIRECT LABOR), IS ASSUMED, AND AN HOURLY RATE OF 60 CENTS HAS BEEN TAKEN FOR BASE.

A reduction in the working week				Increases the percentage of overhead to be charged against direct labor from 175% to—	Increases the overhead charge in dollars against each productive employee's working hour from $1.05 to—
From		To			
55	Hours	50	Hours	192% overhead	$1.17 per hour
55	"	48	"	200% "	$1.20 " "
55	"	44	"	218% "	$1.30 " "
55	"	40	"	240% "	$1.44 " "
55	"	36	"	267% "	$1.60 " "
55	"	35	"	275% "	$1.65 " "
55	"	30	"	320% "	$1.92 " "
50	"	48	"	182% "	$1.09 " "
50	"	44	"	198.8% "	$1.19 " "
50	"	40	"	218% "	$1.30 " "
50	"	36	"	243% "	$1.46 " "
50	"	35	"	250% "	$1.50 " "
50	"	30	"	291% "	$1.75 " "
48	"	44	"	191% "	$1.14 " "
48	"	40	"	210% "	$1.26 " "
48	"	36	"	233% "	$1.40 " "
48	"	35	"	240% "	$1.44 " "
48	"	30	"	280% "	$1.68 " "
40	"	36	"	190% "	$1.14 " "
40	"	35	"	200% "	$1.20 " "
40	"	30	"	233% "	$1.40 " "

by this single shift. These fixed charges **are** fixed charges, and, with the exception of the power charge, they remain the same whether employees work ten hours, six hours or three hours per day. The only difference is that each employee must earn as much in six hours employment, or three hours employment, as he formerly did in ten hours, in order to cover the fixed charges against his hourage.

✦ ✦ ✦

THIS overhead charge against direct labor may easily increase the total labor charge to a point which makes labor practically unemployable. The product will not be wanted. It is not only too expensive—it is out of reason.

✦ ✦ ✦

NEEDLESS to say, such a condition opens the doors for most extensive importations from foreign countries.

✦ ✦ ✦

FOR instance:—consider an employee at 60c per hour, who, upon a fifty-five hour week basis, had an overhead charge on direct labor of 175%, or $1.05 per hour, to earn, in addition to his own labor charge of 60c per hour. This employee, reduced to a 30 hour week, has an overhead charge of 320% against each hour, or $1.92 overhead, to earn for each of the 30 hours in addition to his own labor charge of 60c per hour. Can his employer possibly charge $2.52 per hour?!

✦ ✦ ✦

THESE overhead charges are inescapable, and must be paid in order to do business. See Table 1 herewith in which is shown **the automatic increases in overhead costs, due entirely to reduction in working hours per week.**

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LET us now take up cost comparisons of a series of similar machines under two or three different weekly hourages.

✦ ✦ ✦

IN Table 2 herewith are different costs taken for a fifty-five hour week, thirty-five hour week and thirty hour week.

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AND, if the employees' wages rates are increased to a point where they are paid as much for thirty hours as for forty hours, Table 3 shows the costs as they will confront the owners and managers of the great majority of the small manufacturing plants of this country. **An average increase of more than 80%!**

IN the past, and under normal conditions, it took a great deal of activity and hard work to sell the products of these innumerable little plants, both at home and abroad. But it is going to be an enormously difficult task to sell the same products at these new prices. Some of these plants will get local jobbing and contract work, but most of them will simply close up, or drag along with two or three employees, on repair parts and work of this character, and meantime foreign products can be imported against almost any kind of duties and make a very handsome profit.

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IT may also interest us to consider an estimate of the losses in purchasing power in such single shift industries under such working conditions and these are shown in Table 4 herewith.

✦ ✦ ✦

IT has been said, and it will be said (and indeed it is a favorite remark of the theorists) that in such industries, "The employees will be found to do as much work in a thirty hour week as in a forty, fifty or sixty hour week." The person of experience will merely ask, "How may this be accomplished?" Tools, equipment and machines will

TABLE 2

SOME MACHINE COST COMPARISONS UNDER NRA IN A SINGLE SHIFT FACTORY

Fifty-five hour Week (Single Shift)						Thirty-five Hour Week (Single Shift)					
Machine	Labor Hours	Labor @ 60c	Material	Overhead @ 175%	Total Machine costs without Profit	Machine	Labor Hours	Labor 69c	Material *	Overhead ** @ 275%	Total Machine costs without Profit
A	161	$ 96.60	$ 20.16	$ 169.05	$ 285.81	A	161	$111.09	$ 20.16	$ 265.65	$ 396.90
B	179	107.40	41.70	187.95	337.05	B	179	123.51	41.70	295.35	460.56
C	407	244.20	136.91	427.35	808.46	C	407	280.83	136.91	671.55	1089.29
D	721	432.60	370.00	757.05	1559.65	D	721	497.49	370.00	1189.65	2057.14
E	1195	717.00	590.00	1254.75	2561.75	E	1195	824.55	590.00	1971.75	3386.00

TABLE FOR 35 HOUR WEEK

Machine	Increase per cent.	Increase dollars
A	39%	$11.09
B	36%	123.51
C	35%	280.83
D	31%	497.49
E	32%	824.55

TABLE FOR 30 HOUR WEEK

Machine	Increase per cent.	Increase dollars
A	70%	$ 200.92
B	66%	223.39
C	62%	507.93
D	57%	899.76
E	58%	1491.36

Fractional hours and fractional percents disregarded
* Increases in material not yet fully ascertainable; old figures taken
** Taken on original 60c rate to forestall possible criticism

not be run any faster; there will be just as many interruptions, and as much lost time generally, in proportion, and the majority of production managers and superintendents have found in their experience that such statements are simply not true.

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THE objections to a reduction in weekly hourage may be summarized as follows:

The majority of our manufacturing plants must be run on single shift basis. They cannot derive any benefit from operating on double or triple shift whether they had the business or had not the business, nor can they employ more help on the reduced week. What really happens is that the output of each little factory is reduced; the cost of production within it increased enormously; the employees' purchasing power is reduced very materially; and the competitor in foreign countries gets quite a "break."

1934
Annual Meeting
of the
Wire Association
Will be held at New York, N. Y.
OCTOBER 1-5 INCLUSIVE
For Detailed Information Write
Richard E. Brown, Secretary
17 E. 42nd Street New York, N. Y.

TABLE 3

MACHINE COSTS FROM TABLE 2 UNDER A 30 HOUR WEEK SINGLE SHIFT

Machine	Labor Hours	Labor 80c Rate	Material Increases at least 20%	Overhead 320%	Total Machine Costs Without Profit	Per cent. Increase	Dollar Increase
A	161	128.80	24.19	412.16	565.15	98%	279.34
B	179	143.20	50.04	458.24	651.48	93%	314.43
C	407	325.60	164.29	1041.92	1,531.81	89%	723.35
D	721	576.80	444.00	1845.76	2,866.56	83%	1,306.91
E	1195	956.00	708.00	3059.20	4,723.20	80%	2,161.45

TABLE 4

LOSS IN EMPLOYEES' PURCHASING POWER UNDER VARIOUS REDUCED WORKING WEEKS

Let us take the case of a small plant with 25 Productive employees, having an average hourly rate of .5322 cents and each earning, in a week of 55 hours, an average of $29.27 per week.

—oOo—

In a 40 hour week each man will earn an average of $21.29, and
" " 35 " " " " " " " " " " 18.63, "
" " 30 " " " " " " " " " " 15.97, "

Showing direct losses in purchasing power, respectively, for each man of (a) $7.98 (b) $10.64 (c) $13.30.

—oOo—

If, under N.R.A. or P.R.A. an addition is made to the hourly rates of 15%, each man will then earn, in a 40 hour week, an average of $24.47, in a 35 hour week, an average of $21.42, and in a 30 hour week an average of $18.35.

Showing direct loss in purchasing power, respectively for each man of (d) $4.80 and (e) $7.85 and (f) $10.92, as compared with earnings on a fifty-five hour week basis.

The total weekly and yearly losses in purchasing power, for 25 men in one plant under the different hourages are shown below:

	Weekly			Yearly	
(a)	—	$199.50	(a)	—	$10,374.00
(b)	—	260.00	(b)	—	13,520.00
(c)	—	332.50	(c)	—	17,290.00
(d)	—	120.00	(d)	—	6,240.00
(e)	—	196.25	(e)	—	10,205.00
(f)	—	273.00	(f)	—	14,196.00

A Review of Recent Wire Patents

No. 1,949,593, WIRE FABRIC SEAM AND METHOD OF PRODUCING SAME, Patented March 6, 1934 by Albert B. Weissenborn and William E. Buchanan, Appleton, Wis., assignors to Appleton Wire Works, Inc., Appleton, Wis., a corporation of Wisconsin.

This wire fabric is particularly adapted for use with an Fourdrinier paper making apparatus and more particularly the invention lies in the provision of a soldered or brazed seam for the fabric, which seam is thin, narrow and substantially uniform in thickness, and will not interfere with drainage.

✦ ✦ ✦

No. 1,950,125, SPRING STRUCTURE, Patented March 6, 1934 by George A. Stackhouse, Oakland Calif., assignor to L. A. Young Spring & Wire Corporation Detroit, Michigan.

A spring structure is provided for bed springs and the like, the inventor constructing the springs so that side sway or lateral sagging of the top frame is prevented.

✦ ✦ ✦

No. 1,950,182, MULTIPLE CONDUCTOR CABLE, patented March 6, 1934 by Ernst Kirch, Berlin-Oberschoneweide, Germany, assignor to General Electric Company, a corporation of New York.

In this cable, earth leakage leading to short circuits is prevented if the inventor employs a two-conductor cable, belted or not as is convenient, and in the construction the cross section of each conductor and its associated insulation may be segmental or circular.

✦ ✦ ✦

No. 1,950,186, COIL SPRING INSERTING MACHINE, Patented March 6, 1934 by Charles Lofman, Riverside, Ill., assignor to S. Karpen & Bros., Chicago, Ill., a corporation of Illinois.

The machine is particularly intended for inserting coil springs in fabric pockets employed in cushion making. Means is provided to automatically open the edges of the fabric pocket mouth preparatory to feeding the springs thereinto.

✦ ✦ ✦

No. 1,950,188, MACHINE FOR FABRICATING COILED SPRING STRUCTURES, Patented March 6, 1934 by David T. Owen, Cleveland, Ohio, assignor to The Owen Automatic Spring Machinery Company, a corporation of Ohio.

This invention provides a machine which will unite a number of coiled wire springs together simultaneously in paralleling rows and is stated to be an improvement upon the patentee's former U. S. patent 1,705,821, dated March 19, 1929 and 1,756,434, dated April 29, 1930.

✦ ✦ ✦

No. 1,950,858, ROPE, Patented March 13, 1934 by Harold G. Metcalf, Auburn, N. Y., assignor to Columbian Rope Company, Auburn, N. Y., a corporation of New York.

In the construction of this rope, a wire strand coil is provided and lubricated with a colloid rubber, a second group of wires is wound about the first group with a stabilizing cover preferably of rubber to which the group is attached by vulcanizing.

Complete Descriptions and Drawings of Patents May Be Had for 25 cents. Address, Wire & Wire Products, 17 East 42nd St., New York.

No. 1,950,901, WIRE DRAWING MECHANISM, Patented March 13, 1934 by Edwin J. McIlvried, Akron, Ohio, assignor to The Vaughn Machinery Company, Cuyahoga Falls, Ohio, a corporation of Ohio.

More particularly the invention lies in means for cooling wires wound upon a drawing drum or block, the cooling means comprising a fan and a plurality of ducts.

✦ ✦ ✦

No. 1,951,232, NEEDLE POLISHING MACHINE, Patented March 13, 1934 by James Baxter, Glasgow, and William Tivendale, Clydebank, Scotland, assignors to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey.

The machine is particularly applicable for polishing the heads of sewing machine needles and the invention is concerned mostly with the provision of a novel polishing head.

✦ ✦ ✦

Na. 1,951,548, WIRE-POLISHING APPARATUS, Patented March 20, 1934 by Charles D. Johnson, Worcester, Mass., assignor to Johnson Steel & Wire Company, Inc., Worcester, Mass., a corporation of Mass.

In the construction of this apparatus a rotary polishing member of wood is provided having a groove for the wire, means being provided to supply an abrasive material to the wire while in the groove.

✦ ✦ ✦

No. 1,951,687, METHOD OF STRETCHING WIRE ROPES, Patented March 20, 1934 by Georg Zapf, Cologne, Germany, assignor to Felten & Guilleaume Carlswerk Actien-Gesellschaft, Cologne-Mulheim, Germany.

The wire ropes referred to in this patent are those employed in bridge constructions. The method comprises stretching the finished wire rope before being applied to the particular work for which it is to be used by applying clamps to the ends of successive individual sections of the rope and stretching each section successively by applying tensional forces to the clamps.

✦ ✦ ✦

No. 1,951,722, WIRE DRAWING MACHINE, Patented March 20, 1934 by Rudolf C. Breuer, Arlington, N. J., assignor to Frank Johnson, Glen Ridge, N. J.

For a wire drawing machine, the inventor provides a take-up mechanism comprising a pair of power driven pulleys with an arm pivotally mounted on the axis of one of the pulleys having a double grooved guide wheel mounted on the arm. A spring is provided for urging the arm in the direction to tension the wire in passing from the first pulley to the next.

✦ ✦ ✦

No. 1,951,723, METALLIC CONDUIT, Patented March 20, 1934 by Gorman C. Burd, Brooklyn, N. Y., and Hector C. Griswold, Summit, N. J., assignors to American Cable Company, Inc., a corporation of Delaware.

This conduit is stated to be intended for receiving the operating cables of automobile brakes and is built up of a series of helically wound wires.

✦ ✦ ✦

No. 1,953,893, CABLE, Patented April 3, 1934 by Philip H. Chase, Bala-Cynwyd, Pa.

In this cable, a metallic sheath is provided with a number of conductors therein and a number of radially arranged and relatively flat expansible tubes disposed between the conductors, the tubes being electrically joined with the sheath.

✦ ✦ ✦

No. 1,954,414, METHOD AND MACHINE FOR MAKING WIRING STRIP, Patented April 10, 1934 by Louis Kalischer, Brooklyn, N. Y.

The machine is adapted for constructing an armored wiring strip so that the turned over margins are cut away at points, although the machine is also adapted for constructing wiring strips with the turned over margins continuous and unbroken.

✦ ✦ ✦

No. 1,954,525, WIRE STRAIGHTENING, Patented April 10, 1934 by Karl W. Hallden, Thomaston, Conn.

Particularly, this device is adapted for straightening wire supplied in coiled form.

✦ ✦ ✦

No. 1,954,802, COIL WINDER AND METHOD OF WINDING A COIL, Patented April 17, 1934 by Abner Doble, Berkeley, Calif.

More particularly, this winder is intended for handling wire strips such as are employed in heat exchange devices.

✦ ✦ ✦

No. 1,954,961, WIRE DRAWING DIE, Patented April 17, 1934 by Perry G. Sutherland, Peoria, Ill., assignor to Keystone Steel & Wire Company, Peoria, Ill., a corporation of Illinois.

The inventor has provided a water-cooled wire drawing die. The die may be of tantalum carbide or tungsten carbide, or other hard substances.

✦ ✦ ✦

No. 1,954,970, APPARATUS FOR SEVERING FINE WIRE, Patented April 17, 1934 by Wesley Wilson, Chicago, Ill., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of N. Y.

A continuously rotatable severing means is provided with means for advancing the wire towards the severing means and a device actuated by the advancing of the wire for intermittently moving a portion of the wire into engagement with the severing means.

✦ ✦ ✦

No. 1,955,692, ELECTRIC CABLE, Patented April 17, 1934 by Earl R. Thomas, Palisades Park, N. J.

In the construction of this electric

(Please turn to page 190)

Exports and Imports of Wire

Exports of Iron and Steel Wire Products in March 1934 and March 1933
(In gross tons)

	March 1934	February 1934	March 1933
Wire rods	1,180	1,190	148
Hoops, bands and strip steel	3,038	1,884	1,276
Plain black or galvanized iron or steel wire	2,842	3,374	571
Barbed wire and woven wire fencing	3,233	3,324	1,691
Woven wire screen cloth	62	59	73
Wire rope	220	120	233
Insulated iron or steel wire and cable—see analysis below			
Other wire and manufactures	328	313	179
Wire Nails	1,300	966	482
Tacks	48	45	36
Other nails, including staples	427	263	153
Bolts, machine screws, nuts, rivets and washers	295	398	312
Total, these 11 classifications	12,973	11,936	5,154

Imports of iron and steel wire and wire products into the United States
(In gross tons)

Concrete reinforcement bars	26	229	303
Hollow bars and drill steel	63	48	74
Merchant steel bars	1,031	1,254	1,506
Wire rods	1,300	864	1,017
Barbed wire	444	347	799
Round iron and steel wire	241	147	420
Telephone and telegraph wire	1		
Flat wire and strip steel	122	184	71
Wire rope and strand	130	103	116
Other wire	93	64	116
Hoops and bands	1,273	1,040	1,077
Nails, tacks and staples	540	414	620
Bolts, nuts and rivets	18	25	11
Total, these 13 classifications	5,282	4,719	6,130

Exports of Insulated Wire and Cable

MARCH, 1934

	Lbs.	Value
	Lbs.	Value
Insulated iron or steel wire and cable	1,149	$ 296
Rubber covered wire	282,092	71,134
Insulated copper weatherproof wire	154,514	21,557
Wire and cable telephone cable	14,468	2,062
Other insulated copper wire	209,584	46,854
Nichel-chrome Electric	20,326	26,066
Total, these 6 classifications	682,133	$167,969

HOWEVER viewed, United States exports of iron and steel products expanded sharply in March to heights scarcely approximated in the past five years. Scrap was, of course, the principal product on a tonnage basis to be exported—in fact, scrap exports at 173,165 tons comprised 66 percent of the March total, but even so the 88,104 tons of non-scrap exports of iron and steel products is higher than were total exports (including scrap) in any month from June, 1931 through March, 1933, and were just under those of July of that year.

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REVIEWING the month on the basis of the products exported it will be found that scrap exports increased 97,281 tons, that a gain of 10,752 tons was registered in tin plate, that shipments of galvanized steel sheets were larger by 3,475 tons, that sales of black steel sheets rose 2,282 tons, and that gains of 1,583 tons were made by welded casing and oil line pipe, of 1,432 tons by skelp, and of 1,326 tons by welded black steel pipe. There was but one decline of consequence—that in heavy rails, 6,907 tons—the largest losses beside this being 986 tons in 'other' plate and 923 tons in galvanized wire.

✦ ✦ ✦

TIN plate was the most important manufactured product exported in March, the total of 27,264 tons finding 32 export markets. Of these Japan was easily the largest, her purchases totaling 7,908 tons, and China the next with a trade of 3,621 tons.

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SHIPMENTS of galvanized steel sheets—7,738 tons in all—found the largest markets to be those of the Philippine Islands (4,056 tons), the Union of South Africa (591 tons), and Brazil (506 tons), while the best outlets located during March for the 7,194 tons of black steel sheets exported were Canada (2,432 tons) and Mexico (1,513 tons). Exports of heavy rails, totaling 3,741 tons, were principally made to Brazil (2,155 tons), while the trade in steel bars (3,121 tons), was largest with Canada (1,425 tons), the Philippine Islands (620 tons), and Panama (372 tons). The barbed wire trade, slightly smaller at 3,115 tons, found no especially outstanding outlets unless Brazil — whose purchases totaled 839 tons—could be so considered. Sales were made, however, to a majority of the Latin American countries.

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THE rise in the import trade, begun in February as a reaction from the decline of the month preceding, continued through March so that shipments in that month in totaling 38,393 tons were 12,986 tons larger than in February.

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THE Netherlands, because of her shipments of pig iron (15,786 tons) which brought the total of her participation up to 15,840 tons, was the principal source of the iron and steel imported in March. Canada was next—her total of 8,447 tons including 6,013 tons of scrap and 1,168 tons of ferro-manganese. Third was British India with shipments of 3,341 tons—all pig iron—while Sweden was fourth with a total of 2,478 tons of which wire rods made up 1,096 tons, and Belgium fifth with structural shapes (1,059 tons) making up a large part of her total of 2,431 tons.

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CARD Clothing imports rose to 27,577 square feet valued at $31,762. Of this quantity all but 1,456 square feet valued at $2,034 came from the United Kingdom—the smaller quantity coming from Germany.

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WIRE cloth and screening receipts rose to 22,669 square feet or more than double the February trade. Included in this quantity were 14,639 square feet

(*Please turn to page 194*)

'Round the World With the Wire Industry

Germany Watches American Prices

THE advance in American prices for wire products has created much interest in German trade circles and it is believed that this advance will lead to an improvement of the wire export business to the United States and higher export figures to such markets in which the American wire industry has grown. No agreement will be signed with the American wire industry as reported, but it has been agreed that in a number of markets particularly Brazil, Venezuela, Columbia and Uruguay the prices of both the American and European industry should be brought to the same level to avoid further price cutting.

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British Wire Imports Show Increase

GREAT Britain is purchasing large quantities of wire products, especially wire nails and wire rods, and their imports for the latter advanced in the first three months to 25,232 tons compared with 8,422 tons last year, and imports for nails 8,353 tons compared with 4,591 tons. Thomas steel quality of wire rods are not produced in Great Britain and importers and makers are demanding greater quantities of this wire rod quality, thus making it necessary to import same. Advance in the nail imports is due to the fact that British prices for thin wire nails of short lengths are much higher than continental.

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British Sales to Latin America

THOUGH the general export business conditions are still low, due to the sharp Japanese competition in many markets, Latin America continues to show a satisfactory outlook particularly in Argentine, Uruguay and Brazil, the latter during the past weeks having bought heavy quantities of wire products. Demands for barbed wire have increased over last year. Following prices are realized at present c.i.f. rio de Janeiro or Buenos Aires in tons and lbs. (paper) :

Barbed wire G 12 10.12.6
Wire nails, average specification of 1-6″ 9.15,
Galvanized wire, basic price 9. 5.0
Fencing wire oval 12/15 G 13.10,
7 Ply strand wire ¼″ 12. 5.0
including the usual commission.

✦ ✦ ✦

German Standards for Wire Rope

GERMANY has just completed a book of references on the standards for wire ropes and high duty wire which will be issued shortly and also translated in French and English.

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Finland Buys Japanese Nails

TWENTY-FIVE tons of Japanese wire nails have been sent to Helsinki, Finland and it is the first time that a Baltic State has imported from that country, and further transactions will probably follow.

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Irish Free State Duties

EFFECTIVE March 3, 1934, the (Irish) Free State Executive Council imposed a duty of 75 percent on the value of bolts, screws, and nuts of foreign manufacture when made of iron or steel or which include these materials in their composition. The order provides, however, that the Minister of Finance may, after consultation with the Minister of Industry and Commerce, authorize the Revenue Commissioners to license any particular person to import without payment of the duty.

✦ ✦ ✦

New High-Tension Cable

HIGH-TENSION cables are known in which the necessary insulation is provided by means of oil-impregnated paper. It has been found that in service, during the alternate heating and cooling periods corresponding to heavy loads and no load, there is a long time-lag in the return of the oil to the active insulating material. With the object of overcoming this difficulty, Standard Telephones & Cables, Ltd., London, has introduced a cable with an elastic cover around the insulation. This cover can be of rubber or rubber composition and exerts a direct pressure on the oil during cooling, and so facilitates its complete return to the paper. Capillary reservoirs may be also used if desired.

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Norsk Aluminum Establishes Subsidiary Company in Sweden

THE Norsk Aluminium Company, of Olso, has now founded a subsidiary in Sweden, the A. B. Svenska Aluminium Kompanie, which is expected before long to cover the whole of the Swedish requirements. Plans are under consideration in various other European countries for the setting up of national aluminum industries.

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Compulsory Syndicate for German Wire Industry Probable

NEGOTIATIONS looking to amalgamation which have long been carried on between the Drahtverband G.m.b.H. Dusseldorf, and the Vereinigung der freien Drahtwerke und Drahtstiftefabriken, Ludenscheid, Westphalia, the two principal syndicates of the *German* wire industry, have met with no success. In view of this failure the German Ministry of Economy has appointed a special commissioner to examine the situation of the wire industry, with a view to establishing a compulsory syndicate of all concerns.

'Round the World With the Wire Industry

Agreement For Elimination Of Competition In Italy

THE low level of prices from which many branches of the *Italian* iron and steel industry and the mechanical trades are suffering has resulted in an attempt to eliminate at least this factor in the economic situation through the establishment of national price-fixing agreements. Within the past two months a number of groups, including the manufacturers of tubular products, tin and zinc containers, and electric motors and turbines, have been brought together and discussions looking toward price agreements begun. Only the pipe and tubing manufacturers have completed a compact, but with this one in operation committees in the other industries are working toward a similar end.

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Brazilian Demand For Steel Products Relatively High

THE demand for iron and steel products compares favorably with the average of the latter months of 1933, which was relatively good and considerably better than during the same period of 1932. The improvement has occurred largely in lines selling in agricultural districts, such as barbed wire and is due to the increased purchasing power in those districts. The American share of this business is slightly greater than it was several months ago.

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Mexico's Three Iron And Steel Companies Active In 1933

THREE companies make up the greater part of the *Mexican* iron and steel industry—La Compania Fundidora de Fierro y Acero de Monterrey, S. A., in Monterrey and La Consolidada, S. A., in Mexico City making steel ingots (as well as other products) and Hierro y Acero de Mexico, S. A., which has its mill in Ferreria, D. F., and which in 1933 made no steel although it did make "hierro dulce" from scrap iron.

✦ ✦ ✦

LA Compania Fundidora de Fierro y Acero de Monterrey, S. A., is the largest of the three. Seventy percent of its 10,000,000 pesos of capital stock is Mexican owned and it is reported to roll some 600 different types of steel products. Final figures of its 1933 production will not become available for several months, but according to Sr. De LaChica, the principal stockholder, the company's production of both pig iron and steel ingots in 1933 exceeded that of 1932 by approximately 30 percent. The 1932 output of pig iron totaled 20,382 metric tons and that of steel ingots 46,133 tons. Comparative 1933 figures based on the application of Sr. De LaChica's estimates to the known 1932 figures were 26,497 tons and 59,-973 tons, respectively. The present practice in this company's steel production calls for a furnace charge consisting of 75 percent of pig iron and 25 percent of scrap. The entire plant is operating 3 shifts daily and, with the exception of pig iron, is stated to be barely able to supply the demand for its products. Numerous extensions have been made to available equipment and others are reported planned in anticipation of an increased demand. Three phases of this company's operations are of especial interest to American steel exporters — first that the domestic demand for round wire has been so great that the company has not yet begun its planned production of barbed wire; second, that the company is now making black tubing from ⅛" to 3", 1932 production totaled 108 tons while that of 1933 is believed to have been more than double that figure and that within 2 months will be producing galvanized pipe and fittings of the same sizes; and, third, that within 5 months, according to Sr. De La-Chica, the company will be producing iron and steel sheets and tin plate, with 1934 production to total between 50,000 and 60,000 tons. This will be the first production of sheets and tin plate in Mexico.

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LA CONSOLIDADA does not make pig iron (The Monterrey Company being the only producer in Mexico), but makes its steel ingots from scrap iron. Production of these ingots in 1932 totaled 3,500 tons, but this figure was increased in 1933 to 10,970 tons. The company's open hearths are working 24 hours daily employing three shifts while the electric furnaces are operating 16 hours daily with two shifts. A leading product is reinforcing bars—the company having difficulty in supplying the demand because of the unusual building activity. The demand on the part of the National Railways for steel castings, another leading product is increasing. Extensions in plants and equipment costing 500,000 pesos are currently under way, the principal improvement being in the brass foundry.

✦ ✦ ✦

HIERRO y Acero de Mexico does not make pig iron or steel ingots, but rather makes iron billets from scrap iron. This product, known in Mexico as "hierro dulce" or soft iron is rolled and/or fabricated into such commercial products as iron reinforcing bars, window sashes, and many similar products. The company possesses facilities for the manufacture of steel ingots, but these furnaces have not been in operation for a long time. Reports have it that these furnaces will, after improvements are completed, be placed in operation.

(*Please turn to page 195*)

Make Your Plans Now

To Attend The Annual Convention and Exposition Of The Wire Association

To Be Held At New York, N. Y.

OCTOBER 1-5, 1934 ✦ ✦ ✦

AN UNUSUALLY LIVE AND TIMELY PROGRAM

IS BEING ARRANGED BY THE FOLLOWING

PROGRAM COMMITTEE

H. A. Anderson, President,
Fidelity Machine Co., Philadelphia, Pa.,
President, Braiding and Wire Covering
Machine Manufacturers Association.

Dr. S. A. Braley, Industrial Fellow,
Mellon Institute of Industrial Research,
Pittsburgh, Pa.

Allan B. Dove, Chemical Engineer,
Steel Company of Canada, Ltd.,
Hamilton, Canada.

Paul R. Fast, Plant Superintendent,
Belden Manufacturing Company,
Chicago, Ill.

P. W. Grassell, President,
Wilson Steel Products Co.,
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Canada Wire and Cable Co., Ltd.
Toronto, Can.

M. A. Kent, Assistant General Works Manager,
General Cable Corp.,
White Plains, N. Y.

U. C. Tainton, Metallurgist,
Baltimore, Md.

Frederick A. Westphal, Supt. Wire Mills,
Sheffield Steel Co.,
Kansas City, Mo.

The Braiding and Wire Covering Machinery Manufacturers Association will meet jointly with the Wire Association and one full session will be devoted to these subjects.

✦ ✦ ✦

New Motion Pictures showing production processes of steel wire from the ore to the finished wire will be shown through the courtesy of the Youngstown Sheet and Tube Company.

✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦

ALL WIRE MILL MEN ARE INVITED TO ATTEND.

REDUCED RATE RETURN TRIP RAILROAD CERTIFICATES

FURNISHED TO MEMBERS OF THE WIRE ASSOCIATION.

✦ ✦ ✦

HEADQUARTERS—HOTEL NEW YORKER—EXPOSITION—PORT AUTHORITY BUILDING.

✦ ✦ ✦

FOR DETAILED INFORMATION ADDRESS

RICHARD E. BROWN, SECRETARY

THE WIRE ASSOCIATION 17 EAST 42ND ST., NEW YORK, N. Y.

Aluminum Electric Transmission Cable

(*Continued from page 173*)

The Stranding Operation

3. FOR the **stranding** of the seven-strand and nineteen strand cable, Larmuth type machines are used. They are of conventional design and similar to the type employed in stranding other non-ferrous or steel cable. For cables or more than nineteen-strand dimensions, the stranding machines employed are of the planetary type. These machines are arranged in units of 6, 12, 18 and 24 bobbin heads. The steel wire and the aluminum wire are stranded simultaneously.

✦ ✦ ✦

A. C. S. R. is shipped in wooden reels of several sizes, varying from 40 in. to 66 in. in diameter, and varying in weight, including lagging, from 190 lb. to 580 lb. The light weight of A. C. S. R. permits of long standard lengths without excessive weight. The gross weight of cable and reels varies from 1,130 lb. to 6,620 lb. Reels are designed not only as suitable shipping packages, but also with much attention to the requirements of cable installation in the field.

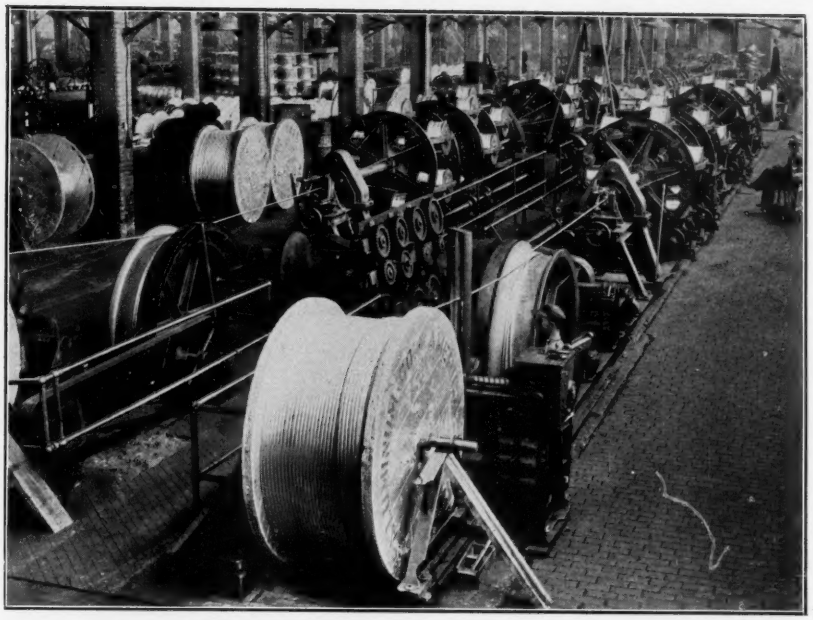


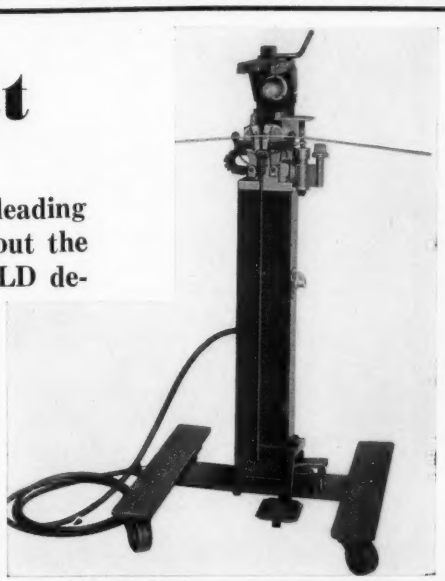
Fig. 3. Stranding machines. The foreground shows the finish of the stranding operation. In the background the stranding is begun by feeding a steel core wire through the first spiders. Each spider has a number of bobbins of steel or aluminum wire which rotate and thus build up the proper number of aluminum strands and the steel core. ✦ ✦ ✦ ✦ ✦ ✦ ✦

MICROMETER PRECISION MICRO-WELD TRADE MARK REG. U. S. PAT. OFF.

Micro-Weld Butt Welders

The increasing use of these efficient butt welders by leading wire manufacturing and fabricating plants throughout the world, is evidence of the superiority of MICRO-WELD design and construction.

Only MICRO-WELDERS are equipped with the patented MICRO-WELD adjustment dials for making precision welds faster.

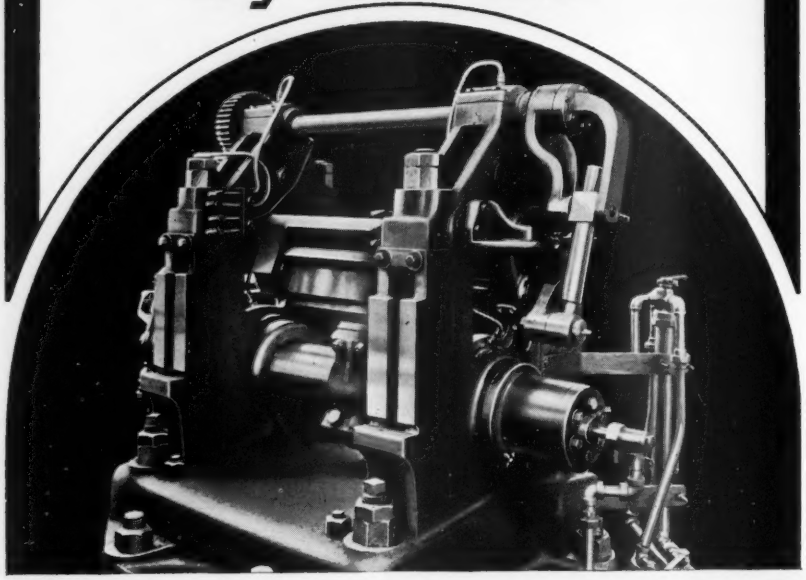


MICRO PRODUCTS COMPANY

20 NORTH WACKER DRIVE, CHICAGO, ILL.

Telephone State 7468 **General Offices and Factory, Peoria, Ills.**

FLYING SHEAR *by LEWIS*



FOR ROD MILLS, BAR MILLS AND STRIP MILLS

Either Steam, Air or Electrically Driven. We will be glad to send you complete data on this thoroughly modern and efficient shear.

LEWIS

LEWIS MAKES A COMPLETE LINE OF ROLLING MILL MACHINERY INCLUDING:

Mill drives up to and including 6,000 HP. Shape Straightener Machines up to and including 24 inch I beam. Motor operated Screw-Down for Mill. High Speed Gear Sets for Continuous Rod Mills. Continuous Bar and Billet Mills. Cold Mills for Sheet and Strip. Rail Breakers. Rail Re-Rolling Mills. Universal Mill Spindles. Chilled Iron and Iron Alloy Rolls for Iron, Steel, Brass, Copper, Aluminum, Zinc and Nickel. For hot Sheets, tin plate and strip—for cold sheets, tin plate and strip. For merchant bars and rods, Shears—Vertical Alligator—Cropping—Plate and Squaring. Special Machinery—Testing Machines and Iron and Steel Castings.

PITTSBURGH, PA.

LEWIS FOUNDRY & MACHINE CO.

A Review of Recent Wire Patents

(*Continued from page 184*)

cable, compensation is made for contraction and expansion of the insulating material so as to prevent the formation of voids within the jacket of the cable.

✦ ✦ ✦

No. 1,955,024, ELECTRIC CABLE, Patented April 17, 1934 by Adolf Rohs, Kladno, Czechoslovakia, assignor to Felten & Guilleaume Carlswerk Actien-Gesellschaft, Cologne-Mulheim, Germany.

This cable includes a wire conductor of non-circular cross section having a core with its longitudinal axis lying in a straight line and the remaining wires forming a strand which is twisted about a core so that their non-circular cross-section makes one revolution about the core in a distance approximately equal to the pitch with which the strand is to be cabled.

✦ ✦ ✦

No. 1,955,424. HEAT RESISTING FIXTURE WIRE AND METHOD OF MAKING THE SAME, Patented April 17, 1934 by Anthony P. Hinsky, Brooklyn, N. Y., assignor, by mesne assignments, to Pyro Products Corporation, Brooklyn, N. Y., a corporation of New York.

The method comprises applying a fibrous body of insulating material directly upon the wire conductors, and treating the fibrous body with a moisture and fireproof saturant, then applying a colored opaque compound containing a wax base over the saturant to form a colored jacket, so as to conceal the saturant and then applying a coating of wax over the jacket.

✦ ✦ ✦

No. 1,955,468, ELECTRIC CONDUCTOR CABLE, Patented April 17, 1934 by Maxwell E. Noyes, Mount Lebanon, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa., a corporation of Pennsylvania.

This cable is particularly adapted for overhead power lines of high voltage and is stated to be flexible with a relatively high tensional and compressional strain resistant.

✦ ✦ ✦

No. 1,955,517, METHOD OF WELDING ENDS OF WIRE FABRIC AND THE FABRIC, Patented April 17, 1934 by Karl Ulrich Schuster, Giengen-on-the-Brenz, Germany, assignor to F. Oberdorfer G. m. b. H., Heidenheim-on-the-Brenz, Germany.

The fabric itself comprises two extremities welded together by a welding seam parallel to the weft threads, the warp threads of one extremity being united individually and directly to the warp threads of the second extremity by welding joints within the space between two adjacent weft threads and out of contact with the weft threads.

✦ ✦ ✦

No. 1,955,762, WINDING MACHINE, Patented April 24, 1934 by Auguste L. Saltzman, Orange, N. J., assignor, by mesne assignments, to General Cable Corporation, New York, N. Y., a corporation of New Jersey.

A new type of take-off means is provided in this winding machine for the winding of copper wire into helics or bobbins.

Acid Cleaning Plant

(*Continued from page 176*)

percolate to centre of coil. Steeping finished, the material was again hoisted and passed to the washing place, where it was submitted to washing by a hose. Force of water caused the load to spin, and the operator by varying speed of spin was enabled to wash efficiently without moving position.

✦ ✦ ✦

WASHING operation completed the load was next moved to the coating stand, constructed to allow bottom bar to rest on T iron without risk of slip. Lowering the bar to rest, hooks and top bar were released and carried by the crane to starting point for further work.

✦ ✦ ✦

DURING coating time the material was constantly under the eye of the operator manipulating hose, who found it an easy matter when washing further loads to direct water on material undergoing coating in order to prevent drying. It was found that by this method of holding in suspension during the coating operation, material acquired an even coat throughout the coil.

✦ ✦ ✦

WHEN deemed coated, sling hooks were inserted in holes in bar for this purpose, the material again hoisted, then carried over and immersed in the lime tank. Again raised the material was carried a few feet further to loading space and there lowered on to bogie. At this point the smaller bar was withdrawn and the load and bogie run into the drying plant. After the drying operation was completed the bogie was run into the mill and unloaded, this being the second and final operation of handling.

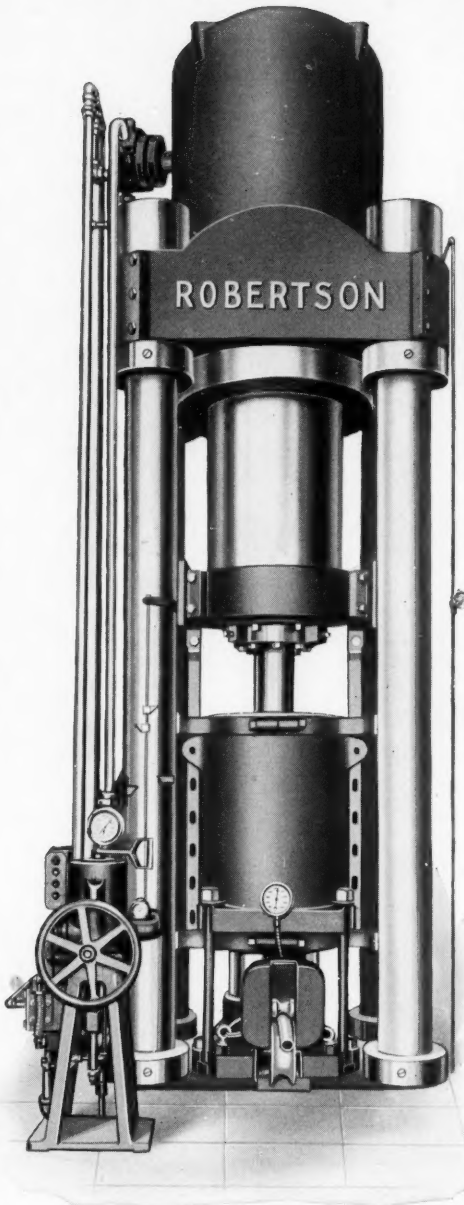
✦ ✦ ✦

Bogie Design

THE provision of a suitable bogie; one which would allow material to slide in position and remain upright during drying operation; proved a knotty problem,

(*Please turn to page 192*)

Lead Encasing Presses



that are practically "a standard" here and abroad

Robertson Lead Encasing Presses are used exclusively in many plants in the United States, Europe and Japan—for extruding lead sheath directly onto electrical wires and cables from ¼" to 5" outside diameter. Similar presses are used in the Rubber Hose Industry for placing a lead sheath onto uncured rubber hose so that it may be properly vulcanized.

The presses such as illustrated herewith range in capacity from 1000 tons to 2,500 tons and are supplied with complete operating equipment.

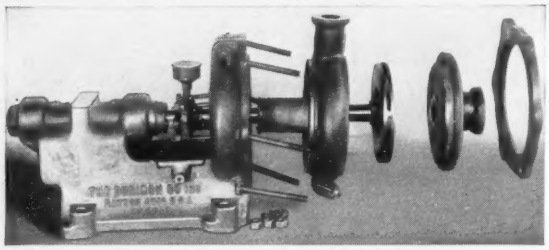
If it's a problem in Metal Extrusion or Lead Encasing, CONSULT ROBERTSON.

Are you receiving our little magazine, "Robertson Reminders"? If not, send us your name and address, and we'll gladly send it to you—regularly.

Robertson equipment includes: Lead-encasing Presses for Electrical Cable and Rubber Hose Manufacturers — Extrusion Presses for Lead Pipe, Lead Traps, Solder and Lead Wire. Sheet Rolling Mills, Hydraulic Pressure Pumps. Hydro-pneumatic Accumulators.

John ROBERTSON CO. INC. — *Pioneers~Since 1858*

125-137 Water Street — Brooklyn, N. Y.



Did you ever see an Acid Pump that was any simpler to assemble?

And its simplicity means lower maintenance costs, improved efficiency, better performance on the job—all things of interest to you.

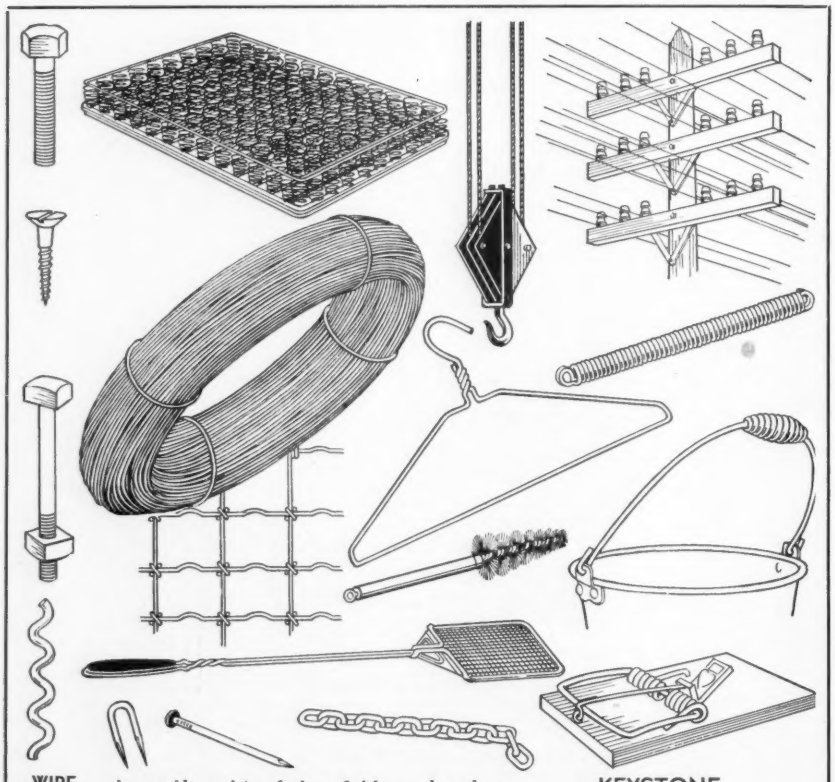
There are several features you ought to know about if you use acid or alkali pumps—the compactness of the unit . . . the closed type impellers . . . special bronze bearings . . . method of holding pump housing under compression . . . resistance of Duriron and Durichlor to Sulphuric and Muriatic Acids and to abrasion as well . . . the range of sizes . . . the lower prices.

It will pay you to investigate these pumps and find out their adaptability to your use.

Write for Bulletin 172. It has much to interest you.

The Duriron Company, Inc.

442 N. Findlay St., Dayton, Ohio



WIRE . . . in a wide variety of sizes, finishes and analyses for the manufacture of products that require a special wire. Your inquiry will receive the careful attention of an organization experienced in furnishing uniform high quality wire that improves your product and reduces its cost.

KEYSTONE STEEL & WIRE CO.

PEORIA, ILL.

Simplicity In Acid Cleaning Plant

(*Continued from page 191*)

WHILST many designs submitted were altogether too elaborate for the purpose, the prices of suitable types were far beyond what was considered a satisfactory figure, and it was decided to construct these in own works as shown in Fig. 4. Total cost—labor and material—amounted to £3-17-9 per bogie, as against £10 to £15 from outside quotations. The cost of replacement of parts over a period of 4 years was nil, wear and tear being practically infinitesimal.

✦ ✦ ✦

THE construction, as will be observed, is fairly simple, and the load when lowered remains upright without risk of slip. Thus, the services of one operator only were necessary to guide the load on the bogie, release sling chains and withdraw bar.

✦ ✦ ✦

How To Utilize Plant For Cleaning With Sulphuric Acid

THIS plant, as previously described, was designed particularly for cleaning high carbon shape material in muriatic acid, (HCl), at atmospheric temperature. With the addition of steam for acid heating purposes it can be utilized for cleaning with sulphuric. It is advisable however to employ wood or lead-lined wood, tanks in place of the stone, as the variation in temperature due to heating the cleaning liquor has a detrimental effect on the latter.

✦ ✦ ✦

WITH sulphuric as the cleaning agent, particularly in the cleaning of cylindrical material, the output should be practically doubled; the attack of sulphuric at 60 degrees C. being roughly three times that of cold muriatic. The amount of hydrogen occluded by metal at this temperature is greater, but detrimental effects are counteracted by the shorter period of immersion.

Temperatures

DURING the first three months of operation experiments were conducted with a view to ascertaining the most efficient drying temperature. Subjected to 300 degrees C. the material was found to be thoroughly dry at the end of two hours, but the coat was hard and made plastic deformation difficult. At 100 degrees C. corrosion set in before the lime was dry. When dried at 180 degrees C. drawing dies gave 100 per cent output beyond that of the temperatures previously mentioned.

✦ ✦ ✦

Conclusions

IN conclusion it should be noted that whilst the weight of material finished may appear little above the average, the improved coat made slip during drawing operation much easier, with resultant longer employment of dies. The use of the steeping tank eliminated those defects usually attributable to acid rust.

✦ ✦ ✦

Youngstown Sheet & Tube Plans New Strip Mill

THE Youngstown Sheet & Tube Company plans to install a continuous wide strip mill, and it is understood prices are being sought. According to present plans, the plant will be located at Campbell. A complete wide continuous strip mill with all necessary finishing equipment, with capacity of between 40,000 and 50,000 tons per month is contemplated.

✦ ✦ ✦

American Steel & Wire Company To Erect New Mill

WORK has been commenced on a new mill at the South Works of the American Steel & Wire Company, 94 Grove Street, Worcester, Mass. The new mill will be all steel construction, 189 by 103 ft. It will provide for eight soaking pits, cranes and other equipment. Plans for the project were prepared by the company's own engineer.

INDISPENSABLE!

◆

THREE WIDELY USED OAK DRAWING LUBRICANTS

Super Draw No. 5
Master Draw No. K
For copper, brass and phosphor bronze.

Master Draw No. 2
For steel and alloy steel wire. Particularly adaptable to draw bench work.

Master Draw No. 425
For drawing bars and shapes, (high or low carbon) on draw benches, WITHOUT LIME COAT.

Proper drawing lubricants are as indispensable as the machines on which your products are drawn. Your lubricants should be fitted to local conditions and to the brass, bronze, steel or copper.

The Oak Chemical Products Company will be glad to assist you in the determination of the right lubricant. Your inquiry will receive prompt, careful attention without obligation to you. Write today!

◆

OAK CHEMICAL PRODUCTS COMPANY
Bechtelsville, Pa.

LUBRICANTS FOR COLD DRAWING ANY TYPE OF METAL

Promote increased die-life in Wire Drawing by using
Bell-Mine Pulverized Lime

●

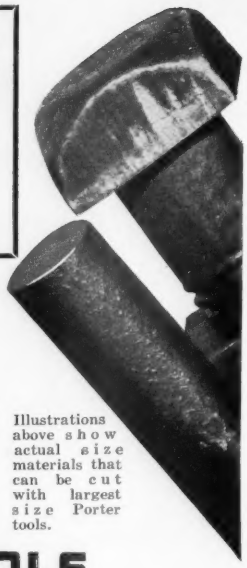
For years this lime has given satisfaction in regular use. Names of plants and experienced users will be given gladly on request.

●

AMERICAN LIME AND STONE CO.
(OPERATING UNDER N. R. A. LIME CODE)
PLANT and EXECUTIVE OFFICE: BELLEFONTE, PA.
Sales Offices: PITTSBURGH PHILADELPHIA NEW YORK CITY

Bell-Mine Product

SPECIAL JAWS *for* SPECIAL NEEDS

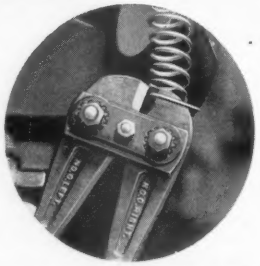


Illustrations above show actual size materials that can be cut with largest size Porter tools.

PORTER HKP *portable*
two hand **CUTTING TOOLS**

Cutters for soft wire, spring wire, tempered wire, piano wire, stranded guy wire, wire rope and cables, insulated wires, live wires, etc., as well as for bolts, rods and bars.

Write for illustrated circular. Porter Tools are sold by leading jobbers and supply houses.



H.K.PORTER INC. Everett, Mass.

WIRE MILL FOR SALE

EQUIPPED TO DRAW FINE WIRE

In sizes from No. 15 to 36. All Finishes.

Located in East—Accessible to all Markets—
Low price—Satisfactory Terms.

FOR INFORMATION ADDRESS

BOX 200—C/O WIRE AND WIRE PRODUCTS

17 East 42nd St., New York, N. Y.

POSITION WANTED

METALLURGICALLY and steel plant trained engineer specializing for ten years in sales and practical servicing of steel mill products, desires connection in sales or service executive capacity.

✦ ✦ ✦

EXPERIENCE covers establishment, development and training of technical sales organizations to sell and service in the galvanizing, tinplating, pickling and chrome nickel alloy fields.

✦ ✦ ✦

FULL details upon request. Reply box 600, Wire and Wire Products, 17 E. 42nd St., New York, N. Y.

Exports and Imports

(*Continued from page 185*)

from Germany, 6,088 square feet from Canada, 1,276 square feet from France, and 666 square feet from Netherlands.

✦ ✦ ✦

FOURDRINIER wire imports were very small at 3,604 square feet—2,404 square feet coming from Sweden and 1,200 square feet from Czechoslovakia.

✦ ✦ ✦

THE trade in wire fencing and netting was much smaller than in February. Only 543,500 square feet of that galvanized before weaving and 4,140 square feet of that galvanized after weaving coming to hand in that month. The trade in the first of these classes of material included 531,600 square feet which came from Germany and 11,900 square feet which came from the Netherlands, while all of the second class of material came from the last named.

✦ ✦ ✦

EXPORTS of iron and steel wood screws during March, 1934 totalled 38,871 gross, valued at $9,784. Of this total the United Kingdom took 14,250 gross, valued at $7,107; Philippine Islands took 6,465 gross, valued at $611; Cuba 5,300 gross valued at $690; Japan 5,050 gross valued at $522; Colombia 2,410 gross, valued at $267; and Salvador 1,427 gross, valued at $118.

✦ ✦ ✦

EXPORTS of brass wood screws totalled 11,509 gross, valued at $2,414. Of this amount China took 7,242 gross, valued at $1,300; the Philippine Islands, 1,345 gross, valued at $310; Cuba, 823 gross, valued at $171; Venezuela 509 gross, valued at $66; Canada 463 gross, valued at $270.

✦ ✦ ✦

IMPORTS of wood screws during the same period amounted to 4,500 gross, valued at $296, from Sweden.

Are you coming to the Wire Association meeting at New York, N. Y., Oct. 1 to 5th inclusive?

'Round The World With The Wire Industry

(*Continued from page 187*)

Sir George Sutton, Bart. Henley's Famous Chief Dead

SIR George Sutton, Bart., president of W. T. Henley's Telegraph Works Co., and of Henley's Tire & Rubber Co., died recently at Walmer, England. He was 77 years of age, and had been in failing health for a long time.

✦ ✦ ✦

SIR George, who was one of the best-known figures in the British wire and cable industry, had been with the Henley undertaking since 1880, when the original business of that extraordinary genius, W. T. Henley, was reconstituted and Sir (then Mr.) George Sutton became secretary. Henley, who died in 1882, was one of the most remarkable men the cable industry has produced. He had no education and started life as a dock laborer, but he was gifted with great inventive genius and tremendous energy. However, he was not a business man and quickly got his business into serious financial difficulties.

✦ ✦ ✦

SIR George Sutton it was who, more than anybody else, built up this great corporation and made it a world-wide concern. He secured submarine cable contracts in every part of the world, and was often present at the actual laying of the cables. But he also greatly extended the scope of the firm, turning his attention to the provision of plant for dealing with the growing demand for wires and cables for electrical power.

✦ ✦ ✦

HE was a member of the Institution of Electrical Engineers, vice-president of the Council of the Royal Society of Arts, and vice-president of the Executive Council of the Federation of British Industries. Sir George, who was created a baronet in 1922, married fifty years ago Ruth, daughter of F. C. Goodchild. She died in 1931, and there is no heir. Sir George was often confused with his namesake, Sir George Sutton, Bart., well-known British newspaper magnate and director of the London "Daily Mail."

✦ ✦ ✦

New York Wire Cloth Co.

CONSTRUCTION work was started early in May by the New York Wire Cloth Co., on a one-story fireproof factory building in Louck's Mill Road. The plant, 112 by 180 feet in size, will be equipped for the manufacture of wire, to be used by the company at its main plant for the production of screen wire cloth.

Learn about PARALAN

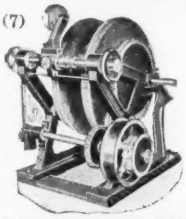
Paralan will give your finished wire and wire products protection from atmospheric corrosion in the mill and in shipping. Paralan-coated wire can be spot welded or soldered without cleaning. Also, Paralan leaves surfaces in good condition for all types of finishes—enameling, japanning, lacquering, plating, etc.

Write for further information. We may be able to solve your difficulties.

AMERICAN LANOLIN CORP.
LAWRENCE, MASSACHUSETTS

MAGNET-WIRE ENAMELING MACHINES, COTTON, SILK, ASBESTOS, PAPER AND OTHER TAPE, WIRE INSULATING MACHINES.

(7)



REELING STANDS With TRAVERSE for reels 30-in., 36-in., 41-in., 60-in. and 72-in. diameter.

Complete Wire Tinning and Wire Electro-Plating Outfits. Wire Saturating Equipment.

Wire-Respooling, Coiling and Wire-Reclaiming Machines. Automobile-Cable and Pressure-Hose Armoring Machines.

"Aimco" Panning Machines, Vulcanizing Pans and Patch-Vulcanizers for Rubber Covered Wire.

Pull-Out Capstans, Reel-Stands and Steel Reels.

EST. 1865 AIMCO INC. 1913
"American" INSULATING MACHINERY COMPANY
REG. U.S. PAT. OFF.
517 West Huntingdon St.
PHILADELPHIA PENNSYLVANIA U.S.A.

SPECIAL MACHINES DESIGNED OR BUILT

NEW ENGLAND BUTT COMPANY
ESTABLISHED 1842
BUILDERS OF
Insulated Wire Machinery
Write for catalog

Dept. W-6
PROVIDENCE, R. I.

CHICAGO OFFICE
20 NORTH WACKER DRIVE

MACHINERY WANTED

No. 3 Eight Die Waterbury upright pulley and clutch or motor drive, 8 or 12" finishing block. Apply Box No. 4, c/o Wire & Wire Products, 17 East 42nd St., New York, N. Y.

WANTED—Salesman with knowledge of wire and wire products, for traveling position which will include promotional work. Some knowledge of jobbing trade desirable. References—Age—Experience. Address Box 3, c/o WIRE & WIRE PRODUCTS, 17 E. 42nd St., New York, N. Y.

VIANNEY

Famous Wire Drawing Diamond Dies

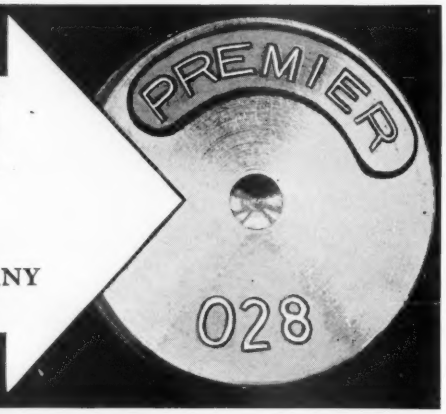
Largest stock in U. S. A.
from .00039 to .080

GUARANTEED WEIGHTS ONLY

VIANNEY WIRE DIE WORKS
250 East 43rd St., New York

"PREMIER"
Trade Mark Reg. U. S. Pat. Off.

Diamond Dies
made by
DRIVER-HARRIS COMPANY
Harrison, N. J.



Patents—Trade Marks

Before disclosing your inventions to anyone send for blank form "Evidence of Conception" and instructions "How to Establish Your Rights".

All cases submitted given personal attention by members of the firm. Information and booklet free.

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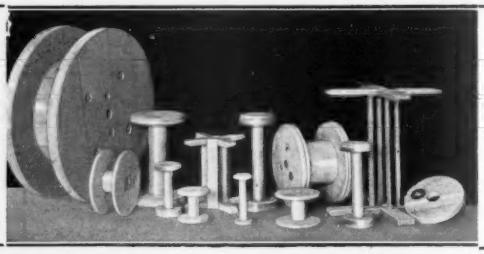
Suite 438, 815-15th St., N.W. Washington, D. C.

WOODEN SPOOLS ROLLS and BOBBINS For WIRE and CORDAGE MILLS



WRITE FOR PRICES

✦ ✦ ✦

AVOCA MFG. CO.
AVOCA, N.Y.

Make your plans now to attend the - -
Wire Association Meeting at New York, October 1-5, 1934

For Information Address Richard E. Brown, Secretary
The Wire Association 17 East 42nd St., New York, N. Y.

Rates on Wire Rope from West Protested

AN effort is being made to lower the rates on wire rope shipped from Los Angeles and other California points to destinations in the states of Texas and Colorado.

✦ ✦ ✦

THE Traffic Bureau of the Chamber of Commerce and the A. Leschen & Sons Rope Company and Broderick & Bascom Rope Company have petitioned the Interstate Commerce Commission to suspend and investigate the legality of a rate of 80 cents per 100 pound on wire rope in carloads minimum weight 60,000 pounds, as published, to become effective May 1 from California to the above mentioned states.

✦ ✦ ✦

THIS is a reduction of 30 cents from the present rate of 110 cents per 100 pounds. It is based upon alleged competitive movement from the three Pacific Coast Cities to destinations in Texas via intercoastal vessels through the Panama Canal to Houston, Texas, and inland by rail.

✦ ✦ ✦

THE petition points out that the rates applicable via the intercoastal route do not justify the proposed rate, that its establishment is not justified by either competitive or transportation conditions, and it would be highly detrimental to St. Louis business in this territory.

✦ ✦ ✦

Ludlum Steel Company Discontinues Its Die Business

THE Ludlum Steel Co., Watervliet, N. Y. announces that it has surrendered its license to the Carboloy Company, owners of the patents on cemented carbide and is going out of the cemented carbide die business.

✦ ✦ ✦

THIS action has been taken because after a trial it was felt that the manufacture and sale of cemented carbide did not fit in sufficiently well with the type of manufacturing and selling done by a steel company.

J. M. Wakefield Appointed Plant Supt., The Holyoke Co., Inc.

THE **Holyoke Company, Inc.,** manufacturers of insulated wire at Holyoke, Mass., announces the appointment of **Mr. J. M. Wakefield** as plant superintendent.

✦ ✦ ✦

MR. Wakefield is a graduate chemist of Clark University and has spent many years in the development and analysis of rubber insulation compounds. He has travelled extensively, having been in the copper mining industry in South America and Arizona. He was superintendent for twelve years, of one of the affiliate companies of General Cable Corporation, and recently in charge of the telephone wire department of the Detroit Insulated Wire Company at Detroit.

✦ ✦ ✦

George Hartley, Inc., Now Located in Waltham, Mass.

George Hartley, Inc. who have been engaged in the manufacture of fine spring wire since 1839 have moved their plant together with the operating personnel to 131 Lexington Street, Waltham, Mass.

✦ ✦ ✦

THE new plant is located in the same building with the Waltham Instrument Corp., which is engaged in the manufacture of hair spring equipment for use in watches, clocks, instruments, gauges, etc., and the two companies are now closely affiliated.

✦ ✦ ✦

Plume and Atwood Take Over Equipment and Business of American Ring Co.

THE American Ring Co., has sold its mechanical equipment to the Plume and Atwood Company and the task of transferring the machinery from one plant to another is at present underway. The American Ring Company will not be dissolved as a corporation, but its line of products will be taken over by the Plume & Atwood Company.

BALLOFFET

The Quality Diamond Dies

1870 1934

BALLOFFET DIAMOND WIRE DIES CO. INC.,
13-15 East 22nd Street, New York City
Factories in France: Lagnieu-Cluses-Trevoux

BISCO

TUNGSTEN CARBIDE DIES
FOR
WIRE, ROD and TUBING

BARE NIBS—SEMI-FINISHED—FINISHED
ROUND AND SPECIAL SHAPES

THE BISSETT STEEL COMPANY
CLEVELAND
WORCESTER PHILADELPHIA CINCINNATI

EFFICIENT PICKLING
REQUIRES "RODINE"

RODINE, SAVES ACID AND METAL
Prevents over-pickling. Minimizes acid brittleness and acid fumes.

Samples and Directions sent on request.

AMERICAN CHEMICAL PAINT CO.
AMBLER, PA.

Detroit Office & Warehouse 6339 Palmer Ave.; E.

Make Your Plans Now
To Attend The
Wire Association Meeting
At New York
October 1-5, 1934

"DOING
ONE BIG
THING WELL"

NEP. 100%
→ INHIBITORS ←

The WM. M. PARKIN CO.
PITTSBURGH, PA.

New HOTEL EDISON
47th ST.
JUST WEST of B'WAY
NEW YORK

1000 ROOMS
EACH WITH BATH AND SHOWER
Circulating Ice Water . . . Radio . . .
Large Closets . . . Full Length Mirrors

OTHER UNUSUAL FEATURES
SUN-RAY HEALTH LAMPS
Roof Solarium . . . Air-Cooled Restaurant

ROOMS *from* $2.50 SUITES *from* $6.00

IN THE HEART OF TIMES SQUARE

PAPER CABLE FILLER
FOLDED PAPER FLATS
PAPER INSULATION YARNS
NATIONAL PATENT REED CO.
3rd & Somerset Sts. Phila., Pa.

Flat Wire Straightening and Cutting Machines
✦ ✦ ✦
Wire Straightening and Cutting Machines
✦ ✦ ✦
Welding Wire Machinery
✦ ✦ ✦
Portable Wire Straighteners
✦ ✦ ✦
Steel Reels of All Kinds
✦ ✦ ✦
THE LEWIS MACHINE CO.
1594 East 24th St., Cleveland, Ohio

Kenneth B. Lewis
CONSULTING ENGINEER
Wire Mill Equipment, Layout and Practice
17 East 42nd St. New York City
43 Midland St. Worcester, Mass.
Phone: Murray Hill 2-4188
Phone 5-6033

W. H. Spowers, Jr.
Consulting Engineer
551 Fifth Ave., N. Y. C.
Specializing in Galvanizing Plants Designed and Installed
Practical Engineering
Vanderbilt 3-7395 Advice

WIRE MILL EQUIPMENT
MORGAN CONSTRUCTION CO.
WORCESTER, MASS.

Wire Mill Equipment, Stranding, Insulating, Drawing, Welding
Thomson-Judd Wire Machinery Co.
Subsidiary of
Thomson-Gibb Electric Welding Co.
Lynn, Massachusetts.

STRIP ZINC
EYELETS
THE PLATT BROS. & CO.
WATERBURY, Conn.

Lower Weight Diamond Dies Now Stocked by Vianney

VIANNEY Wire Die Works announce the putting in stock here of lower weight diamond dies made of selected stones set in solid bronze casings. This type is suitable for wire mills who do not wish large stones or recut dies only to a given size and do not require the heavier weights which are naturally more costly.

✦ ✦ ✦

AS usual, most of Vianney stocks are composed of regular standard weight stones, set in brass. Both types are in guaranteed and stamped weights, this always having been the policy of this firm.

Make Your Plans Now
To Attend The
Wire Association Meeting
At New York
October 1-5, 1934

Utility Tube Moves

THE Utility Tube Company, of Irvington, N. J., has leased a building at 153 Frelinghuysen Avenue, Newark, for a new plant. Present capacity will be expanded. The company manufactures flexible steel conduits, lead cable, etc. Mr. Louis J. Braunstein is president.

✦ ✦ ✦

Norton Iron Works To Resume

THE furnace of the Norton Iron Works at Ashland, Kentucky, which has been idle for several years, will resume operation June 1st. The plant is owned by the American Rolling Mill Company, which purchased it from the Thomas A. Adams Estate about six years ago.

RUESCH
Machinery For
Wire, Tube, And Brass Mills
409 Mulberry St., Newark, N. J.

Broden Construction Co.
Wire Mill and Cold Rolling Equipment
10255 Harvard Ave.
CLEVELAND, OHIO

WIRE DRAWING MACHINERY AND EQUIPMENT
Rod Frames—16" Frames, 8" Frames—Take-Up Frames, Wire Pointers—Puller Tongs.
General Castings for Wire Mill use.
Circulars on Request.
E. J. Scudder Foundry & Machine Co.
Trenton, N. J.

HIGH SPEED
Welding Wire Straightening and Cutting Machinery
Round Wire Straightening and Cutting Machinery
Flat Wire Straightening and Cutting Machinery
Roll and Rotary Wire Straighteners
THE F. B. SHUSTER CO.
New Haven, Conn.
Straightener Specialists Since 1866

JOHN ROYLE & SONS
PATERSON, NEW JERSEY.
MAKERS OF EXTRUDING MACHINES FOR COVERING ELECTRIC CONDUCTORS AND WELDING WIRE

Wire Drawing Diamond Dies
COCHAUD
WIRE DIE CORPORATION
300 W. 56th ST., NEW YORK
Tel. Col. 5-1340

BUYERS' GUIDE

For more complete information, consult the annual Directory, Index & Buyers' Guide.

ANNEALING FURNACES
See Furnaces—Various Headings

ANNEALING POTS AND BOXES
Scudder, E. J., Fdry & Machine Co., Trenton, N. J.

ARMORING EQUIPMENT
Amer. Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

BAKERS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CASTINGS—Wire Mill
E. J. Scudder Foundry & Machine Co., Trenton, N. J.

CHEMICALS—Cleaning
American Chemical Paint Co., Ambler, Pa.
Delany Chemical Co., Tacony Station, Philadelphia, Pa.

CLEANING & PICKLING EQUIPMENT
Broden Construction Co., Cleveland, O.
Duriron Co., The, Dayton, O.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

COATING—Protective
American Lanolin Corp., Lawrence, Mass.

COILERS—Sheet and Wire
H. J. Ruesch Machine Co., Newark, N. J.

CRANES—Wire Mill
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CUTTERS—For Wire, Rods and Bars
H. K. Porter Co., Everett, Mass.

DIES—Diamond
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Cochaud Wire Die Co., New York.
Driver-Harris Co., Harrison, N. J.
Kelly Wire Die Corp., New York, N. Y.
Vianney Wire Die Works, New York.

DIES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

DIES—Repairs & Re-Cutting
Cochaud Wire Die Corp., New York.
Driver-Harris Co., Harrison, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Vianney Wire Die Wks., N. Y.

DIES—Rod and Tube Drawing
Bissett Steel Co., Cleveland, O.
Carboloy Co., Inc., Newark, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

DIES—Tantalum Carbide
Bissett Steel Co., Cleveland, O.
Kelly Wire Die Corp., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

DIES—Tungsten Carbide
Bissett Steel Co., Cleveland, O.
Carboloy Co., Inc., Newark, N. J.
Driver-Harris Co., Harrison, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

DRAW BENCHES
H. J. Ruesch Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Machine Co., Trenton, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

ENGINEER—Consulting Wire Mill
Lewis, Kenneth B., New York, N. Y.

EYELETS—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FILLERS—Paper for Cable
National Patent Reed Co., Philadelphia, Pa.

FURNACES—Annealing
Electric Furnace Co., Salem, O.

FURNACES—Automatic
Electric Furnace Co., Salem, O.

FURNACES—Bright Annealing
Electric Furnace Co., Salem, O.

FURNACES—Electric
Electric Furnace Co., Salem, O.

FURNACES—Lead Melting
Electric Furnace Co., Salem, O.
John Robertson Co., Brooklyn, N. Y.

FURNACES—Non-Oxidizing
Electric Furnace Co., Salem, O.

FURNACES—Wire
Electric Furnace Co., Salem, O.

GALVANIZING ENGINEER
W. H. Spowers, Jr., New York, N. Y.

INHIBITORS
American Chemical Paint Co., Ambler, Pa.
Delany Chemical Co., Tacony Station, Philadelphia, Pa.
Grasseli Chemical Co., Cleveland, O.
Wm. M. Parkin & Co., Pittsburgh, Pa.

INSULATION—Cable or Cable Filler
National Patent Reed Sales Co., Phila., Pa.

LATHES—Die Reaming
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

LIME—Pulverized
Amer. Lime & Stone Co., Bellefonte, Pa.

LUBRICANTS—Wire Drawing
R. H. Miller Co., Homer, N. Y.
Oak Chemical Co., Bechtelsville, Pa.

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
John Robertson Co., Brooklyn, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Thomson-Gibb Electric Welding Co., Lynn, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Braiding
New England Butt. Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Brazing
Thomson-Judd Wire Machinery Co., Lynn, Mass.

MACHINERY—Bunching
Amer. Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bundling
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cable, Electric
American Insulating Machinery Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Thomson-Gibb Electric Welding Co., Lynn, Mass.
Watson Machine Company, Paterson, N. J.

MACHINERY—Chain Making
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Closing
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coil Winding
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Coilers
Broden Const. Co., Cleveland, O.
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Copper Wire Drawing and Rolling
H. J. Ruesch Machine Co., Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

1934

Annual Meeting

OF THE

Wire Association

WILL BE HELD AT NEW YORK, N. Y.

OCTOBER 1-5 INCLUSIVE

IN ASSOCIATION WITH THE

NATIONAL METAL CONGRESS

✦ ✦ ✦

Wire Association Headquarters At Hotel New Yorker

✦ ✦ ✦

EXHIBITION AT PORT AUTHORITY BLDG.

For Detailed Information Write

RICHARD E. BROWN, Secretary

17 E. 42ND STREET NEW YORK, N. Y.

BUYERS' GUIDE, Continued

MACHINERY—Cutting
Broden Construction Co., Cleveland, O.
Lew's Machine Co., Cleveland, O.
F. B. Shuster Co., New Haven, Conn.
Sleeper & Hartley, Worcester, Mass.

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Extruding
John Robertson Co., Brooklyn, N. Y.
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Flat Wire
Broden Construction Co., Cleveland, O.
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Forming
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Galvanizing Wire
Broden Construction Co., Cleveland, O.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Gang Winders
H. J. Ruesch Machine Co., Newark, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Insulating
American Insulating Machinery Co., Phila.
New England Butt Co., Providence, R. I.
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lead Encasing Presses, etc.
John Robertson Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
John Robertson Co., Brooklyn, N. Y.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Magnet Wire
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Measuring Wire & Cable
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Panning
American Insulating Machinery Co., Phila.

MACHINERY—Pointing
Broden Construction Co., Cleveland, O.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Rod Mill
Broden Construction Co., Cleveland, O.
Morgan Const. Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
Lewis F'dry & Machine Co., Pittsburgh, Pa.

MACHINERY—Rolling Mill
Broden Construction Co., Cleveland, O.
Lewis F'dry & Machine Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.

MACHINERY—Rubber Strip Covering
New England Butt Co., Providence, R. I.
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Rubber Tubing and Straining
John Royle & Sons, Paterson, N. J.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Screw Wire
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Special
American Insulating Mach'y Co., Phila. Pa.
Broden Construction Co., Cleveland, O.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry and Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spooling
American Insulating Machinery Co., Phila.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spring Making
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Broden Construction Co., Cleveland, O.
Lew s Machine Co., Cleveland, O.
H. J. Ruesch Machine Co., Newark, N. J.
F. B. Shuster, New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Stranding
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Thomson-Judd Wire Machinery Co., Lynn, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Strip Steel
Broden Const. Co., Cleveland, O.
Lewis F'dry & Machine Co., Pittsburgh, Pa.
H. J. Ruesch Machine Co., Newark, N. J.

MACHINERY—Swaging
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Worcester, Mass.

MACHINERY—Taping
Amer. Insulating Mach. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Thomson-Judd Wire Machinery Co., Lynn, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Tinsel Rolling Mills
Amer. Insulating Mach'y Co., Phila., Pa.

MACHINERY—Trolley Wire
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill
H. J. Ruesch Machine Co., Newark, N. J.

MACHINERY—Welding Wire
Lew's Machine Co., Cleveland, O.
Micro Products Co., Chicago, Ill.
F. B. Shuster Co., New Haven, Conn.
Thomson-Judd Wire Machinery Co., Lynn, Mass.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
American Insulating Machinery Co., Phila.
Broden Const. Co., Cleveland, Ohio.
Morgan Construction Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Thomson-Judd Wire Machinery Co., Lynn, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Thomson-Judd Wire Machinery Co., Lynn, Mass.
Watson Machine Company, Paterson, N. J.

PICKLING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Grasselli Chemical Co., Cleveland, O.
Wm. M. Parkin & Co., Pittsburgh, Pa.
Delany Chemical Co., Tacony Station, Philadelphia, Pa.

MACHINERY—Wire Tinning
American Insulating Mach'y Co., Phila., Pa.

PAPER—Insulating
National Patent Reed Co., Philadelphia, Pa.

POTS—Lead Melting
John Robertson Co., Brooklyn, N. Y.

PRESSES—Lead Encasing
John Robertson Co., Brooklyn, N. Y.

PRESSES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

PULLERS—Wire
E. J. Scudder Fdry. & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

PUMPS—Hydraulic
John Robertson Co., Brooklyn, N. Y.

REELS AND SPOOLS—All Kinds
Avoca Mfg. Co., Avoca, N. Y.
Lew's Machine Co., Cleveland, O.

REEL AND TENSION STAND—
Sleeper & Hartley, Inc., Worcester, Mass.

REEL CRUTCHES
Watson Machine Co., Paterson, N. J.

ROLLING MILLS—See Machinery—Rolling Mill

ROLLS—
Lewis F'dry & Machine Co., Pittsburgh, Pa.

RUST PROOF COMPOUND
American Lanolin Co., Lawrence, Mass.

SOAPS—Wire Drawing
R. H. Miller Co., Homer, N. Y.
Oak Chemical Co., Bechtelsville, Pa.

SPOOLS—Wood
Avoca Mfg. Co., Avoca, N. Y.

STRIP—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TOOLS—Cutting
H. K. Porter Co., Everett, Mass.

TRUCKS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

TUBE BENDERS AND FORMERS
H. J. Ruesch Machine Co., Newark, N. J.

VALVES AND FITTINGS—Acid Proof
Duriron Co., The, Dayton, O.

VULCANIZERS
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS
American Insulating Mach'y Co., Phila., Pa.

WIRE—Enameled For Coils
Winsted Insulated Wire Co., Winsted, Conn.

WIRE—Manufacturers
Keystone Steel & Wire Co., Peoria, Ill.

WIRE—Nickel Silver and Phosphor Bronze
Seymour Mfg. Co., Seymour, Conn.

WIRE—Non Ferrous to Specification
Seymour Mfg. Co., Seymour, Conn.

WIRE—Steel—Also Coppered Steel—Also Galvanized Steel
Keystone Steel & Wire Co., Peoria, Ill.

WIRE AND STRIP—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

This is a carefully classified index of concerns who specialize in this industry and who advertise regularly in WIRE & WIRE PRODUCTS. Please mention WIRE when writing to these firms.

THE WATSON MACHINE COMPANY

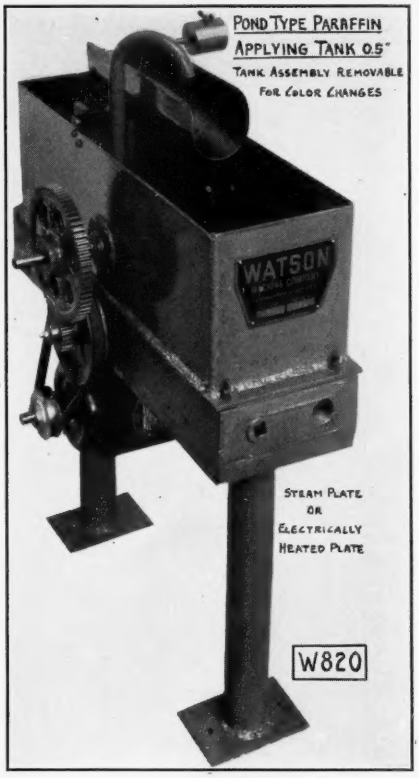
ESTABLISHED 1845

PATERSON, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE, WIRE ROPE AND CORDAGE MACHINERY

TANKS FOR APPLYING COLOR, PETROLATUM, PARAFFIN, Etc.

✦ ✦ ✦



The units W-820 and W-764 are primarily for low specific heat compounds and are supplied for steam or electrical heating.

Tanks W-820 and W-836 are for Flameproof Color Finishing.

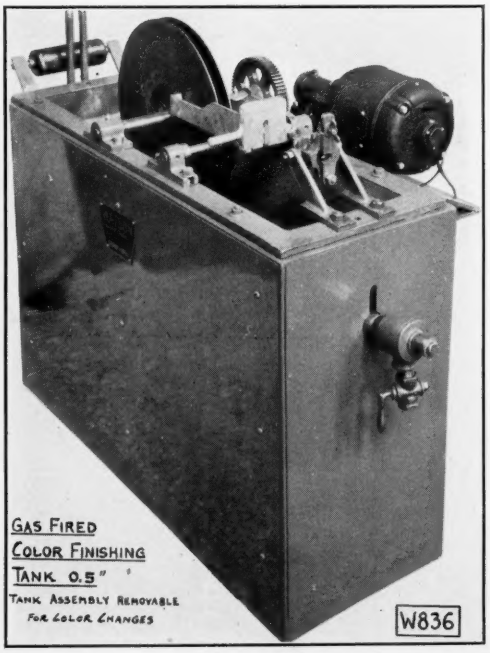
In the latter the color is agitated and raised to POND type immersion trough by rotating discs, the wire touching no metal until it enters primary wiper die. Secondary die is of the rubber squeeze type.

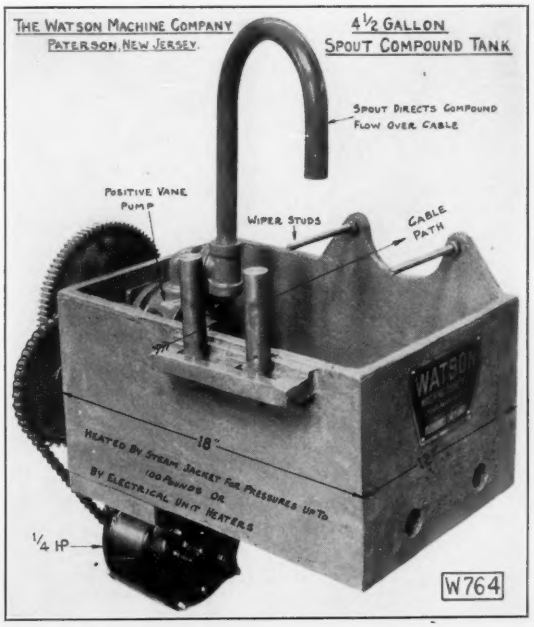
Tank W-764 has pump immersed directly in compound, applying through spout.

Other Tanks designed for applications on machine, such as for Varnished Cambric Taping, where the pump disc is mounted directly on the Taping Head Spindle. Also supplied for drive direct to disc, and with or without Cable Centering Guide.

Letoffs, Polishers, Powderers and Capstan Takeups are shown in separate bulletins.

✦ ✦ ✦





Look into this . . .

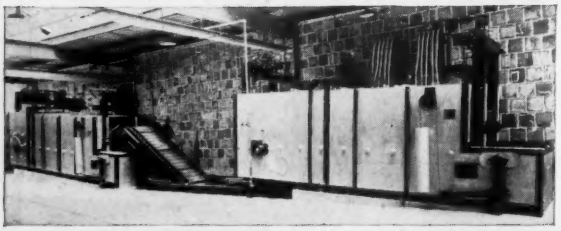
Investigate the Advantages of these Continuous

Chain Belt Conveyor Furnaces

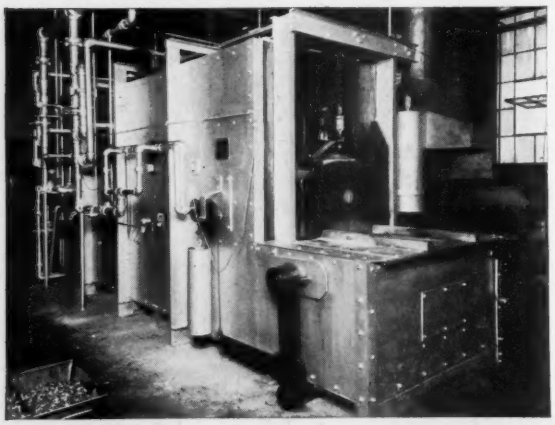
for treating your

Bolts, Rivets, Screws, Springs

and other small and medium size products.



Completely automatic installation, consisting of hardening furnace, quench and drawing furnaces.



Fuel-fired installation hardening bolts, screws, nuts, etc.

The above illustration shows the interior of one of our continuous chain belt conveyor furnaces . . . . The material is carried through the furnace directly on our rugged cast link alloy belt conveyor—no pans or trays are used — 100% net material . . . .

The conveyor returns within the furnace without cooling—resulting in long belt life and low heating cost . . . . Time and temperature automatically controlled—insuring accurate and uniform results

. . . . Built for oil, gas or electric heat, in five standard sizes with capacities ranging from 300 to 1700 pounds per hour . . . . Over 50 in use. Some have been operating for three, four and five years without a replacement of any kind . . .

Also designed for controlled atmosphere for scale free hardening.

Our illustrated bulletin shows 16 installations handling products ranging in size from small screws and bolts to material 48" long. Ask for Bulletin No. 4-30 and investigate the advantages of these furnaces for your products.

THE ELECTRIC FURNACE CO.

SALEM, OHIO.

FUEL FIRED FURNACES

ELECTRIC FURNACES